AUGUST 19, 1957

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

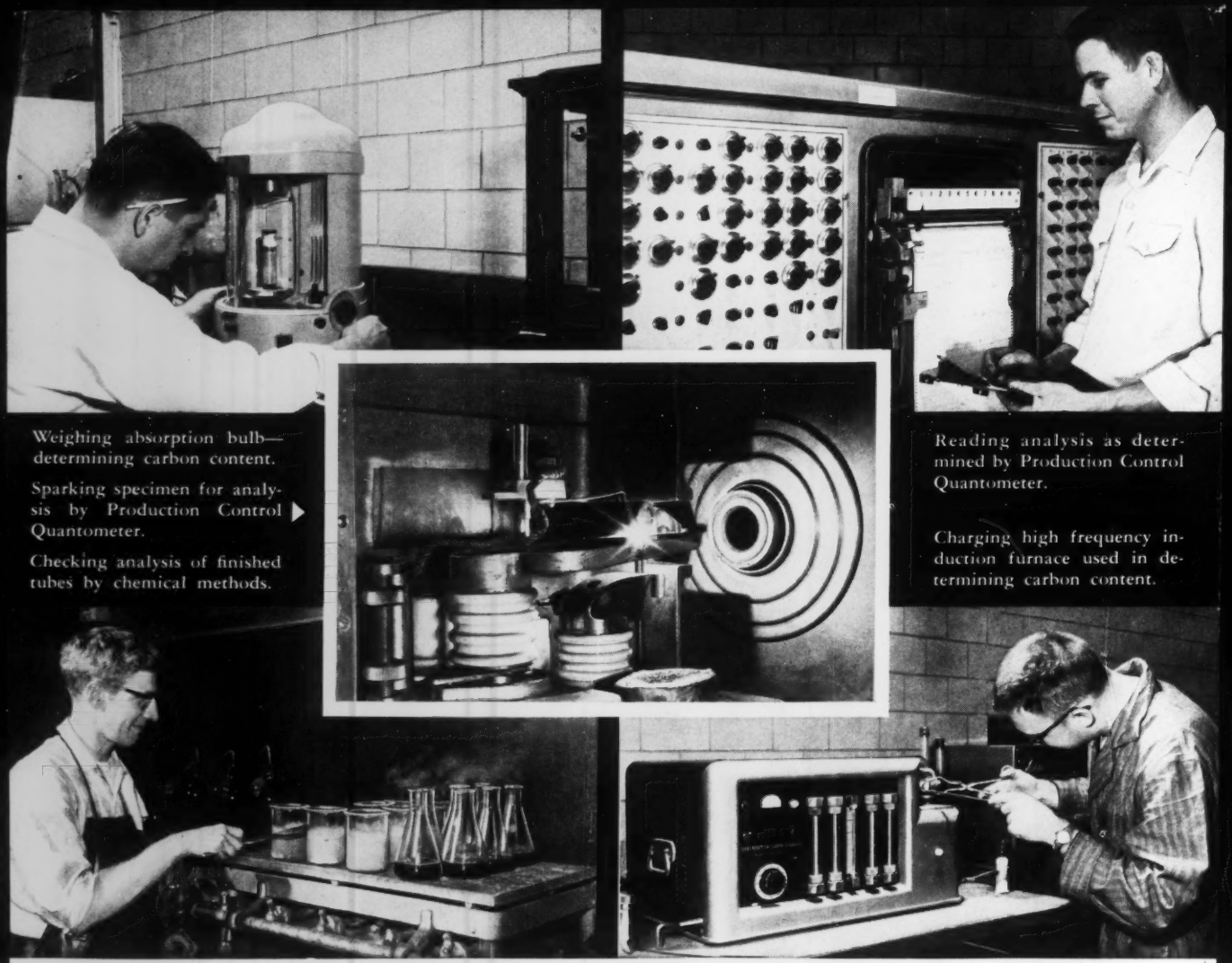
Aluminum Unlimited

We can't use all 2.4 million tons available in '57, yet more is coming. Consumption in '75 will be 3.5 times greater than now...page 107

✔ What Glass Can Offer Metal...page 154

✔ First Half Steel Shipments...page 237

CONTENTS — PAGE 5



Weighing absorption bulb—determining carbon content.

Sparking specimen for analysis by Production Control Quantometer.

Checking analysis of finished tubes by chemical methods.

Reading analysis as determined by Production Control Quantometer.

Charging high frequency induction furnace used in determining carbon content.

THE O.K. YOU DO NOT SEE IS YOUR GUARANTEE

The key to the physical and mechanical characteristics of any steel lies in its analysis. Tensile strength, corrosion resistance, resistance to "creep" at elevated temperatures, reaction to heat treatment—to name a few—are largely determined by composition.

Through B&W's analytical laboratories pass the tubing destined for practically every known type of pressure or mechanical application—hundreds of different steels—each with its own particular characteristics—and checked by technicians who know their job and using the most advanced laboratory equipment available anywhere.

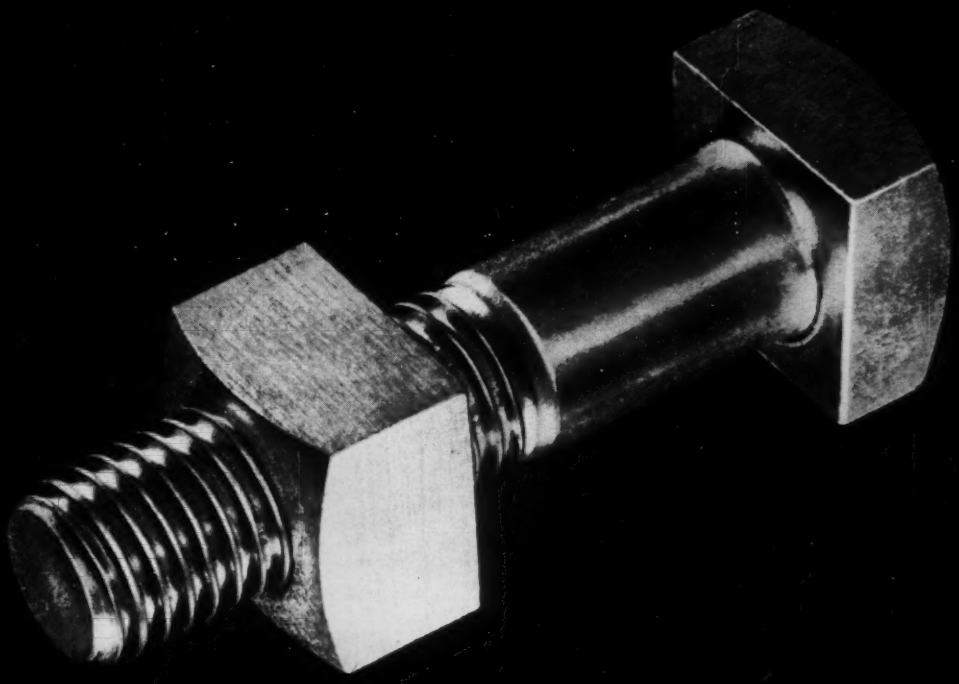
Modern control methods, plus years of experience help to make the B&W laboratory "O.K." the invisible hallmark of tubing quality—and is your assurance of ease of fabrication and good service. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.

B&W

TUBULAR PRODUCTS DIVISION

TA-7019-G3

Seamless and welded tubular products, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels.



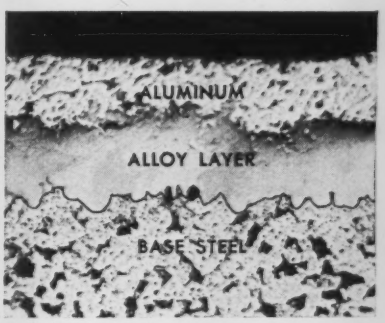
The Bethalume process produces an unusually uniform coating, ensuring clean threads for good fit.

Bethalume Coating Gives Fasteners Better Resistance to Corrosion

Fasteners used in corrosive atmospheres have a much longer service life, and require little or no maintenance, when protected by Bethlehem's Bethalume coating—a hot-dip coating of pure aluminum.

The Bethalume coating is effective in enabling fastener items to withstand the effects of corrosive atmospheres because it adds the permanence of aluminum to the strength of steel. The coating is tightly bonded to the base steel, and is uniform over the entire surface of the fastener. The coated threads are clean and smooth-fitting.

Why not look into the advantages of the Bethalume coating for your fasteners applications? A telephone call to the nearest Bethlehem sales office will bring one of our representatives to your desk promptly.



Photomicrograph of Bethalume coating. Pure aluminum is bonded to base steel by iron-aluminum alloy.

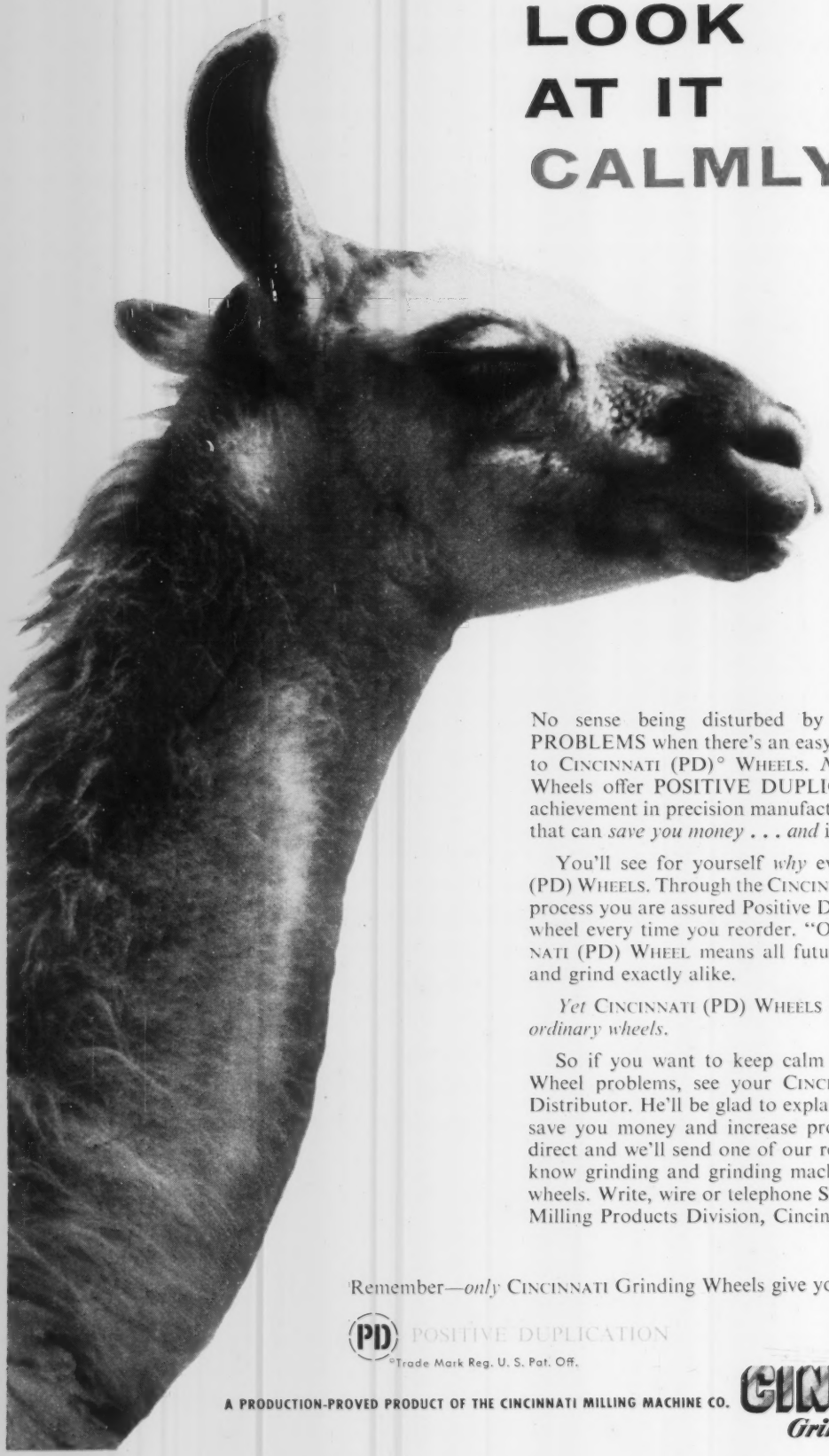
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

LOOK AT IT CALMLY



No sense being disturbed by GRINDING WHEEL PROBLEMS when there's an easy solution in sight. Switch to CINCINNATI (PD)° WHEELS. *Now* Cincinnati Grinding Wheels offer POSITIVE DUPLICATION—a remarkable achievement in precision manufacturing and quality control that can *save you money . . . and* increase your production.

You'll see for yourself *why* everybody's talking about (PD) WHEELS. Through the CINCINNATI (PD) Manufacturing process you are assured Positive Duplication of the original wheel every time you reorder. "On grade" with a CINCINNATI (PD) WHEEL means all future (PD) WHEELS will act and grind exactly alike.

Yet CINCINNATI (PD) WHEELS *are priced no higher than ordinary wheels.*

So if you want to keep calm in the face of Grinding Wheel problems, see your CINCINNATI Grinding Wheels Distributor. He'll be glad to explain how (PD) WHEELS can save you money and increase production. Or, contact us direct and we'll send one of our representatives—men who know grinding and grinding machines as well as grinding wheels. Write, wire or telephone Sales Manager, Cincinnati Milling Products Division, Cincinnati 9, Ohio.

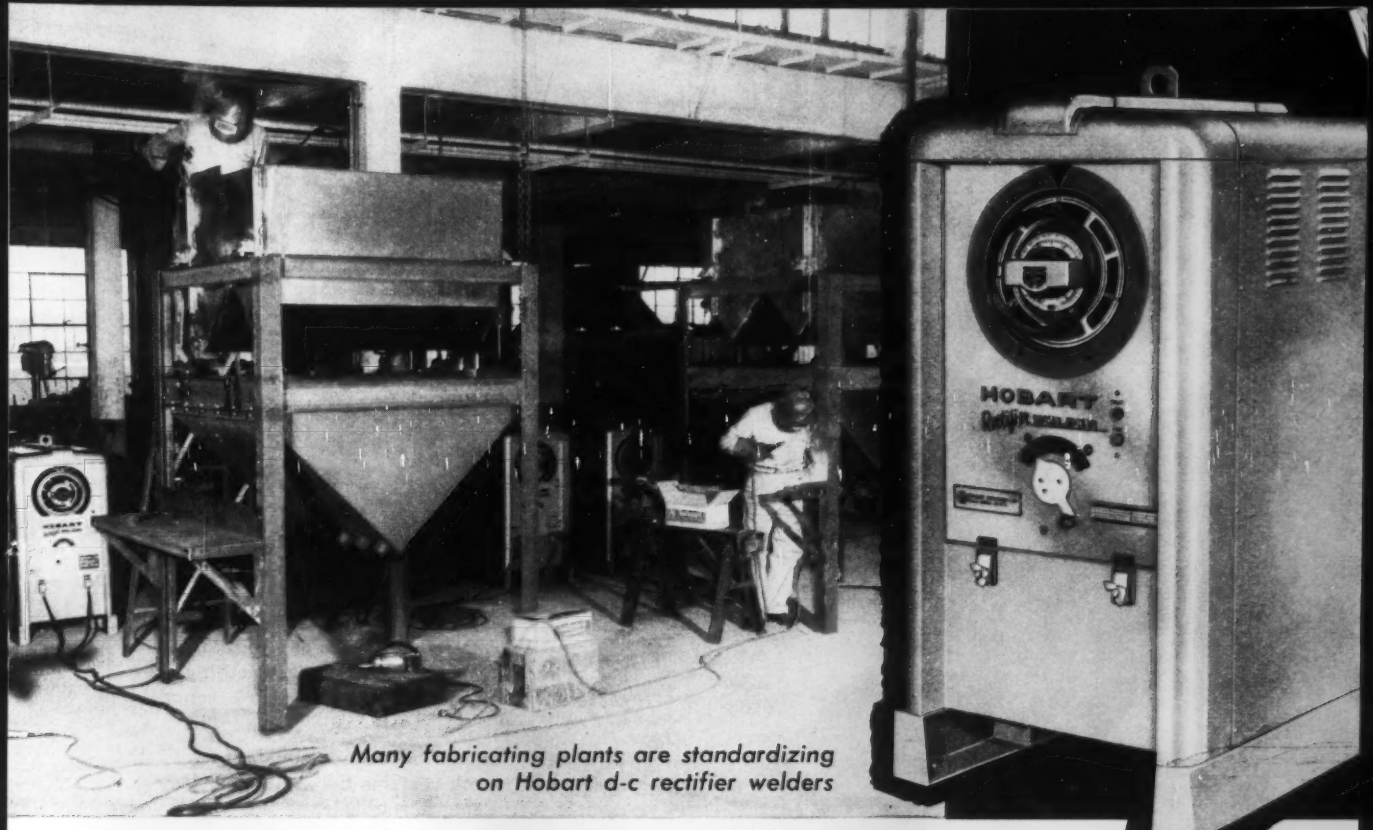
Remember—*only* CINCINNATI Grinding Wheels give you

(PD) POSITIVE DUPLICATION

°Trade Mark Reg. U. S. Pat. Off.

A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

CINCINNATI° *Grinding Wheels*

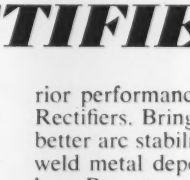


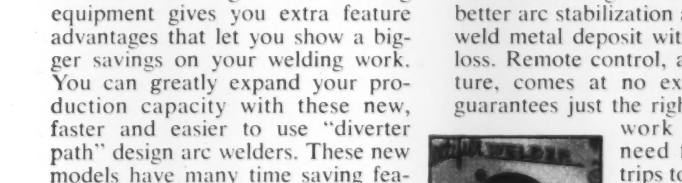
Many fabricating plants are standardizing on Hobart d-c rectifier welders

You can show a BIGGER reduction in welding costs by using HOBART D-C RECTIFIERS!

HOBART'S constant development work in building better welding equipment gives you extra feature advantages that let you show a bigger savings on your welding work. You can greatly expand your production capacity with these new, faster and easier to use "diverter path" design arc welders. These new models have many time saving features that let your welding operators speed their work with assurance of high quality welds. You'll be amazed at the wide welding range and superior performance of the Hobart DC Rectifiers. Brings easier arc striking, better arc stabilization and smoother weld metal deposit with less spatter loss. Remote control, an added feature, comes at no extra cost and guarantees just the right heat at the work without the need for repeated trips to the machine for making adjustments. Here's a welder that justifies checking and comparison, if you want high overall efficiency and more economical operating and maintenance in your welding department. Be sure you get the latest information for your file on this new outstanding welder value. Mail coupon today—no obligation. HOBART BROTHERS CO., Box ST-87, Troy, Ohio *'phone FE 2-1223*

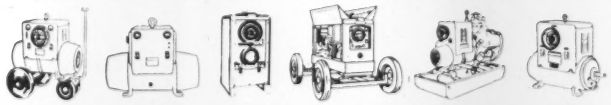
"One of the world's largest builders of arc welding equipment"





Hobart's New Iron Powder Electrodes

This new contact type electrode is heavily coated with iron powder which becomes part of the weld. Try the new Hobart "Rocket 24" electrodes (E-6024). See how they give you greater speed, maneuverability, strength and smoothness.



1. Electric Drive 2. Automatic 3. AC-DC 4. Gas Drive 5. Air-Cooled 6. Belted

HOBART TROY OHIO **WELDERS**

HOBART BROTHERS COMPANY, BOX ST-87, TROY, OHIO

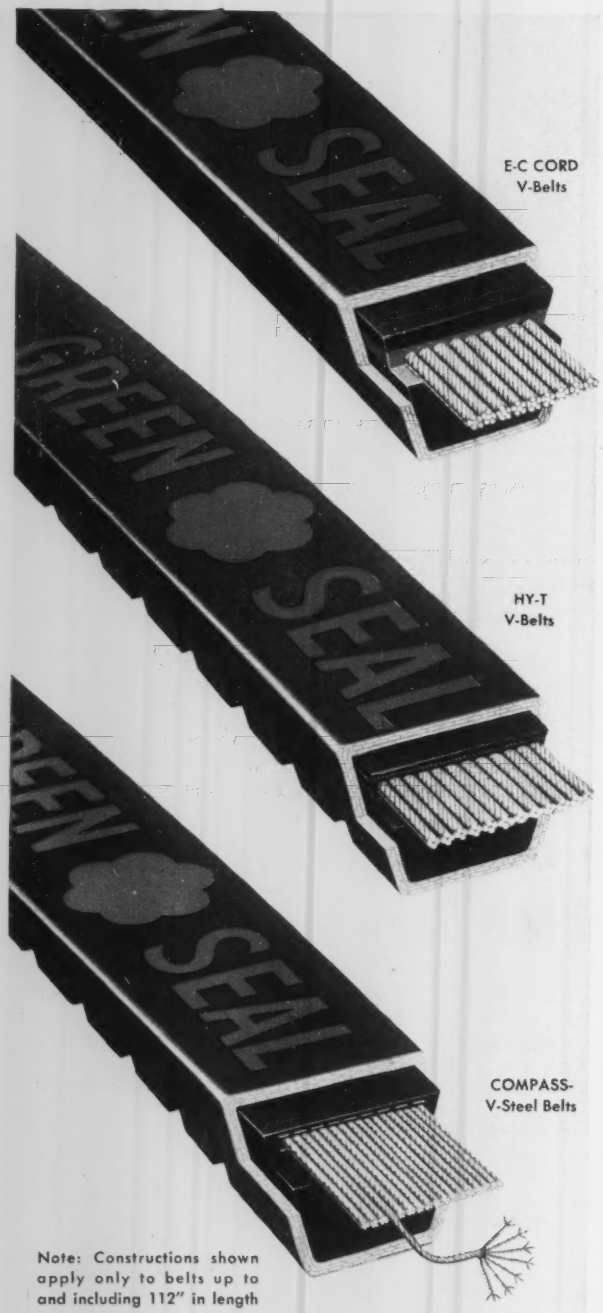
Please send me complete information, without obligation.
☐ *DC Rectifier* ☐ *"Rocket 24" Electrodes*

Also send details on ☐ *1.* ☐ *2.* ☐ *3.* ☐ *4.* ☐ *5.* ☐ *6.*

*Name*_____ *Position*_____

*Firm*_____

*Address*_____



Note: Constructions shown apply only to belts up to and including 112" in length

Why V-Belts with the Green Seal?

The Green Seal is put on each Goodyear multiple V-Belt for *your* protection. For it's your sign of a belt with dimensional stability—something long sought but only recently achieved in a complete line of V-belts.

What does dimensional stability mean to you? It means belt length remains the same from factory to drive. The length you order is the length you get. Matched sets stay matched. And mismatching – the biggest problem in belting multiple drives – is now a thing of the past.

How was this dimensional stability achieved? Until recently, stable belt length was possible only with steel cable load carriers as developed by Goodyear. But now it is also accomplished with synthetic cord through the exclusive Triple-Tempered 3-T process that stabilizes length by careful tempering with Tension, Temperature and Time.

Triple-Tempering also gives you a stronger, more shock- and stretch-resistant belt. Add "balanced construction" – with each component of the belt designed to its job—and you have a smoother-, longer-running belt which means maximum, trouble-free horsepower hours at minimum cost.

DIMENSIONALLY STABLE V-BELTS
with the GREEN SEAL by

GOODYEAR

THE GREATEST NAME IN RUBBER

The Goodyear Tire & Rubber Company, Dept. 794, Akron 16, Ohio

Please send me more information about how V-Belts with the Green Seal solve the major problem in belting multiple V-belt drives.

Name_____

Company_____

Street Address_____

City_____ **Zone**_____ **State**_____

Compass, E-C Cord, Hy-T, Green Seal—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

IN THIS ISSUE

STEEL
The Metalworking Weekly

August 19, 1957
Vol. 141 No. 8

METALWORKING OUTLOOK

101 **Air Force reports new materials** to withstand extreme temperatures in jet engines

COVER ARTICLE

107 **Aluminum looks ahead**—Consumption in 1975 expected to be more than 3½ times greater than in '57

110 **Testy testimony in steel hearings**—Kefauver and Blough clash

111 **Radio net for NATO**—Microwave system extends from Turkey to Norway

112 **Consumer type contest sells valves** for Airmatic

113 **Inland and Republic to build** new facilities in Indiana

117 **USSR power up**—A report on hydroelectric and electrotechnologic gains

☑ 118 **Make your labor pact work**—Make foremen manage labor contracts

135 **Locomotive builder rearranging facilities** at cost of over $1 million

TECHNICAL OUTLOOK

149 **A mechanical marker that can stamp up to 16 digits** and symbols on a slab will go into the new slabbing mill at Republic Steel's Cleveland Works

☑ 150 **Roll planisher shaves welding costs**—Eliminates need for filler wire

152 **Beryllium takes new step** as first large scale private plant is readied

☑ 154 **What glass can offer metal**—Applications and advantages listed

158 **Progress in steelmaking**—Heat over checkers speeds light-up

164 **Selecting coils electronically**—It's done in minutes by fastener firm

167 **Triple-action presses** at Ford plant can handle bolsters up to 100 by 200 in.

☑ 173 **Chromium: Crack-free and bright plate**—Corrosion resistance is better

180 **Fixture checks, tests plane part**—Makes up-to-date fighters safer

183 **Tips on shearing**—Data on selection, setting, and care of knives

☑ 194 **Frigidaire makes cabinet in 38 seconds** as it upgrades production methods

MARKET OUTLOOK

235 **More comfort for steel buyers**—Indexes and composites, 243; steel prices, 244; ores, 250; ferroalloys, 252; scrap trends, 257, prices, 258

☑ 237 **Steel product mix undergoes change**—Plate shipments move up to second place, not far behind cold rolled sheets in first half

260 **Nonferrous metals**—Producers' earnings drop sharply—Prices, 262

REGULAR FEATURES

6 Behind the Scenes
10 Letters to the Editors
16 Staff
23 Calendar of Meetings
105 The Editor's Views
114 Windows of Washington
121 Mirrors of Motordom
125 The Business Trend
129 Men of Industry
201 New Products
223 New Literature
264 Advertising Index

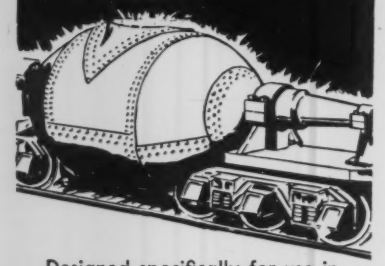
Published every Monday by The Penton Publishing Co., Penton Bldg., Cleveland 13, O. Subscriptions in the U. S. and possessions and Canada, $10 a year; all other countries, $20. Current issues, 50 cents each. Metalworking Yearbook issue, $2. Accepted as controlled circulation publication at Cleveland. Copyright, 1957, The Penton Publishing Co.

Index available semiannually. STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

WALSH APEX

Extra Duty Firebrick

is the last word in high bulk density, low porosity, high heat transfer, maximum resistance to slag penetration and metal wash.



Designed specifically for use in lining closed and semi-closed hot metal torpedo type ladles, hot metal mixers and for checkering open hearths and hot blast stoves, Apex offers greater value per dollar invested. Isn't this the kind of economical service you want from the refractories you use?

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behind the scenes

Psychiatrist Wanted

The human brain is thought to be a whole mess of little cells that rattle against one another when some of them are activated. When the breath of an idea fans them, they make like a set of Chinese glass chimes, and lo: We have association of ideas. In relatively normal individuals, the association is progressively logical; day brings thought of night; cup, of saucer; ham, of eggs; STEEL, of the world's foremost metalworking journal. (Sometimes the local brass reads this page, and we are not above a little apple polishing.)

Well, an advance notice of the aluminum story on Page 107 came to our attention. Part of the copy read ". . . a breathing spell in developing markets for this rapidly expanding metal," and immediately our little glass chimes went into action, producing a thought of all the cracks between the rails of the Canadian Pacific Railroad.

A perfectly normal association. We had an old uncle who used to spend his winter evenings contemplating the enigma of those cracks. "Expanding metal," he declared, "is the very divil for a mathematician like myself." He said that when the rails expanded in summer, reducing the cracks, the company gained a lot of rails over those thousands of miles, and he wondered how much the total gain would weigh.

As for the aluminum article, it suggests the industry's expansion program and outlines future plans; it shows how new markets are being nurtured, especially in the automotive field. In case you couldn't tell at a glance, the Kaiser aluminum ingots illustrated on the cover weigh 5000 lb apiece.

Rough Time Dept.

Several weeks ago some mention was made here of the troubles that dodge Associate Managing Editor John Morgan. It drew an impressive response, but the most articulate by far was a communication from STEEL's Seattle correspondent, R. C. Hill. Mr. Hill has been contributing to this magazine from time beyond memory. We asked old timers, Market Editor Bill Rooney and Consulting Editor John Knox, if they remembered precisely when Mr. Hill sent his first contribution from Seattle. "Oh, sure," they replied. "It was years and years ago."

All we know for sure is that late in July he very nearly wound up as a can of salmon.

"I decided to take a voyage from Vancouver, B. C., to Kitimat, the location of Canadian Aluminum's new power and aluminum plant," he wrote. "First night out a careless crewman directed a hose through my porthole. Next day, I fell through a hole in the floor of a salmon cannery into a mess of fish. Only my size prevented me from following the big fat salmon to the canning machine, and emerging from the other end in a brightly burnished tin can with the other fish. So *Morgan* thinks he has troubles, eh?"

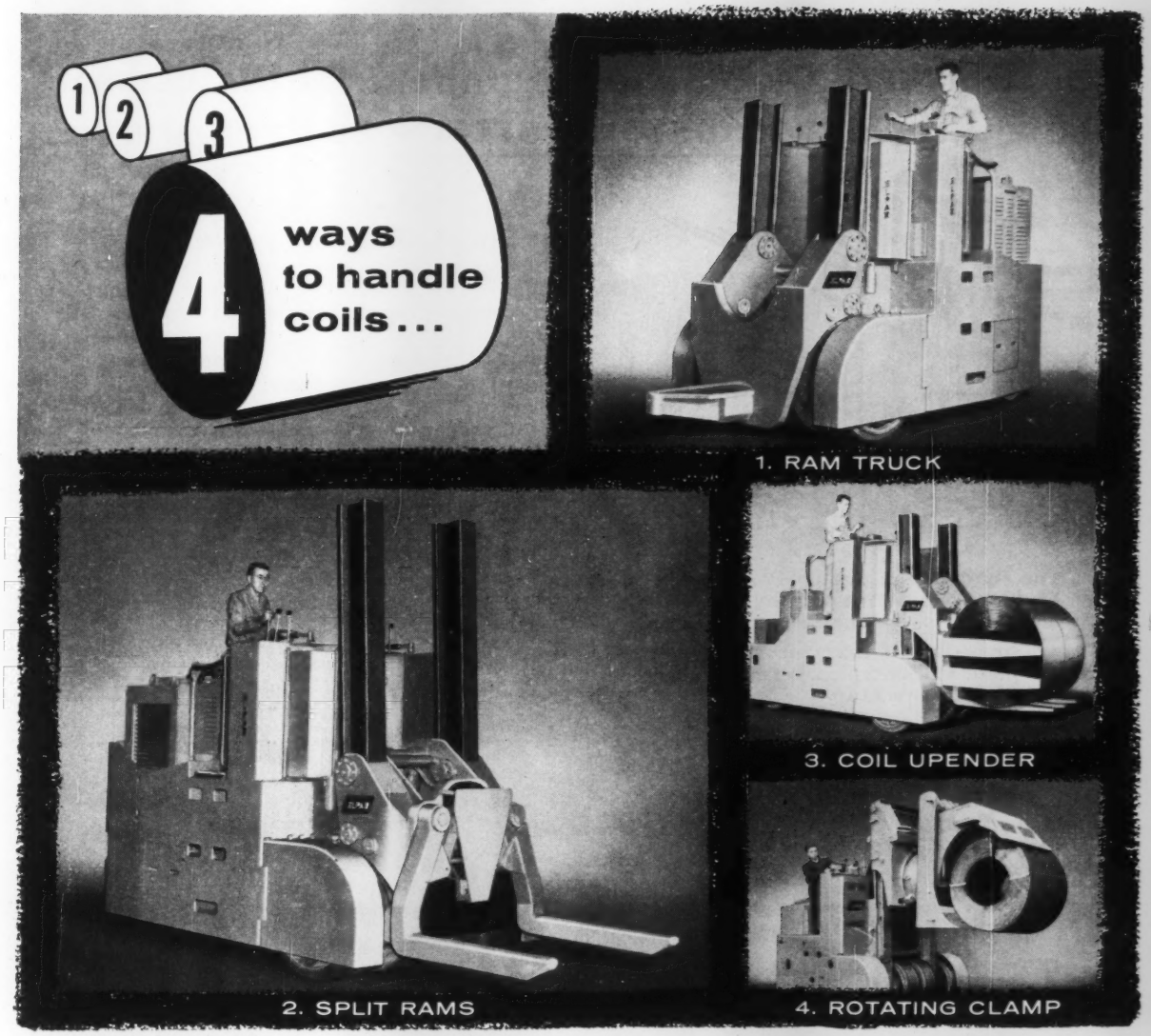
A Cryptic Message

F. E. Armstrong, Budd Co., Gary, Ind., said he was glad to tell us the cryptogram revealed that "in 1955, Dravo Corp., Pittsburgh, built 112 barges and 6 towboats; in 1956, 106 and 13; 1957's backlog of orders includes requests for 14 docks." Ralph C. Trimble, with the able assistance of General Steel Casting's utterly indispensable Charlsie, traced out the answer, too. Curiously enough, more persons want more cryptograms, so here's a variation. This well known nine-word sentence is made up of definitions of each word. 1. Rhymes with Indian butter. 2. To exercise, as patience. 3. Past participle of to join, or intersect. 4. Rhymes with a grunted interrogation. 5. One hostile to another. 6. Further in the same or similar manner. 7. Plural pronoun. 8. Form of a verb meaning to exist. 9. Rhymes with what some dogs do when you scold them.

Good luck, and drop us a card sometime. It's plumb cheerful to hear from the folks.

Shrdlu

(Metalworking Outlook—Page 101)



4 Reasons Why ELPAR Remains Top Choice in Steel Trucks

1. ELPAR RAM TRUCKS—"Old Reliable" with more new features. Dual drive motors, picture-window vision, power hydraulic brakes, dual controls, power steer—these are a few of the plus values that make ELPAR heavy-duty ram trucks the most efficient ever built. Continual design improvement keeps them the standard for the industry.

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4. ROTATING CLAMP—precise coil placement. Hydraulic clamp truck picks up and deposits coils horizontally or vertically... makes it possible to feed coils to equipment in the exact position required.

Benefit from Elwell-Parker's 50 years of steel industry experience. Learn how ELPAR trucks and attachments can cut your multi-ton loads down to manageable size . . .

SEND FOR HEAVY-DUTY TRUCK BULLETINS

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Akron's 97-year-old Hardware & Supply Co. knows quality pipe—its customers demand only the best pipe—so every length in their stock room is marked—"Youngstown". As this veteran distributor's thousands of customers in the Akron-Canton-Massillon area have found from experience, it will pay you to know and deal with your nearest Youngstown distributor. He's in business for only one reason—to supply what you want, when you want it, and in the quantity you require.

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- A single source of supply that will simplify and expedite your purchasing, receiving, and bookkeeping, and,
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Your Youngstown Distributor is waiting to serve you—why not call him today?

Next time you need steel pipe—for any use—specify Youngstown and secure these 7 points of uniform goodness

uniform ductility
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uniform threading
uniform weldability
uniform wall thickness and size
uniform strength and toughness
uniform roundness and straightness

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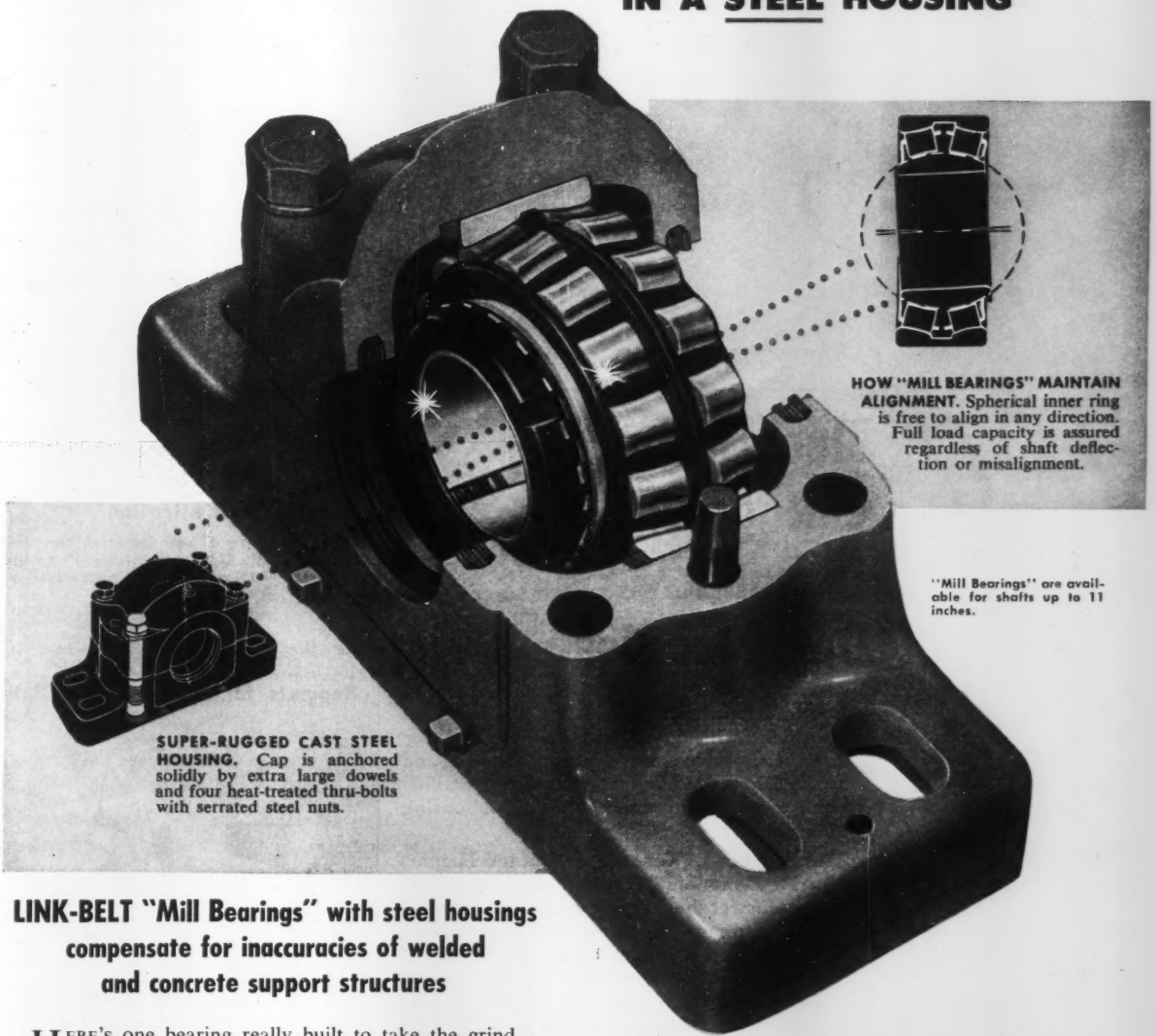
HERE'S self-alignment IN A STEEL HOUSING



HOW "MILL BEARINGS" MAINTAIN ALIGNMENT. Spherical inner ring is free to align in any direction. Full load capacity is assured regardless of shaft deflection or misalignment.

"Mill Bearings" are available for shafts up to 11 inches.

SUPER-RUGGED CAST STEEL HOUSING. Cap is anchored solidly by extra large dowels and four heat-treated thru-bolts with serrated steel nuts.

LINK-BELT "Mill Bearings" with steel housings compensate for inaccuracies of welded and concrete support structures

HERE'S one bearing really built to take the grind and grime of heavy loads in steel mills, mines, foundries and other extra-severe applications. The self-aligning Link-Belt "Mill Bearings" with cast steel housing adjust for misalignment of shafts and support structures. Furthermore, it eliminates the need for extra heavy shafting to avoid deflections which are ruinous to ordinary bearings.

This bearing is effectively sealed, self-contained, factory-adjusted—needs no shims or alignment rings at installation. Get full facts in Book 2565A . . . or Book 2550, which covers industry's most complete line of self-aligning ball and roller bearing blocks. Ask any of the 40 Link-Belt offices or your authorized stock-carrying distributor. 14.442

LINK BELT

THE SYMBOL OF QUALITY — LB — LINK-BELT

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Blueprint of Chicagoland Economic Opportunities

What industrial plant sites are available in Chicago and Chicago Heights? Where are they located in respect to transportation, shipping and other facilities? What materials are plentiful? What is the labor situation? What about housing —and schools?

This new book, "Chicago & Chicago Heights Industrial Economic Blueprint," has been published to answer these questions and many more. With maps, diagrams, charts, photographs and text, it gives you a detailed analysis of the area and its physical characteristics. Here are easy-to-grasp facts about population, labor force, raw materials, transportation, utility and business services. The significant figures covering some eighty-service classifications of manufacturing industries are tabulated for quick reference.

"The amount of detail work that went into the preparation of these reports is truly amazing. In all the years in which we have been engaged in plant location work we have never seen so much data collected on a particular area."—from a letter describing previous economic studies by Chicago & Eastern Illinois Railroad.

Available without charge. For a complimentary copy of "Chicago & Chicago Heights Industrial Economic Blueprint," write Mr. H. Sampson, Vice-President, Chicago & Eastern Illinois Railroad, 332 South Michigan Avenue, Chicago 4, Illinois.

C&EI

Chicago & Eastern Illinois Railroad

LETTERS TO THE EDITORS

Thumbnail Commentary

With every issue of STEEL we receive, I feel compliments are in order for the excellent publication you are turning out. Over and above the attractive appearance is the solid, informative article material which reflects the effort that must go into it.

Your editorial, "Parable of the Prices" (July 15, Page 51), seems to me to be a true thumbnail commentary on today's business scene. We would like to reprint it in our publications.

Ed Brenner
Associate Editor
Publishers Digest Inc.
Chicago

• *Permission granted.*

Your editorial . . . hits the nail so firmly and completely on the head that we are wondering if about 30 reprints are available for distribution to our sales force.

Wayne Belden
Marketing & Public Relations Counsel
Ajax Flexible Coupling Co. Inc.
Westfield, N. Y.

Interest in Arbitration

We have read with interest the article, "Trend Up in Arbitration" (July 22, Page 60), and would appreciate a copy.

H. J. Weymer
Foundry Superintendent
National Bearing Division
American Brake Shoe Co.
Meadville, Pa.

Reprints for Management Club

The Norwalk Industrial Management Club at one of its upcoming dinner meetings is to show a film supplied by the Drop Forge Association. At the showing, we will have circulars of drop forge equipment and parts available for distribution. Your article, "Rolls Forge Precision Parts" (July 8, Page 97) is excellent. Could we have 30 reprints?

Joseph Haas
14 Roosevelt St.
Norwalk, Conn.

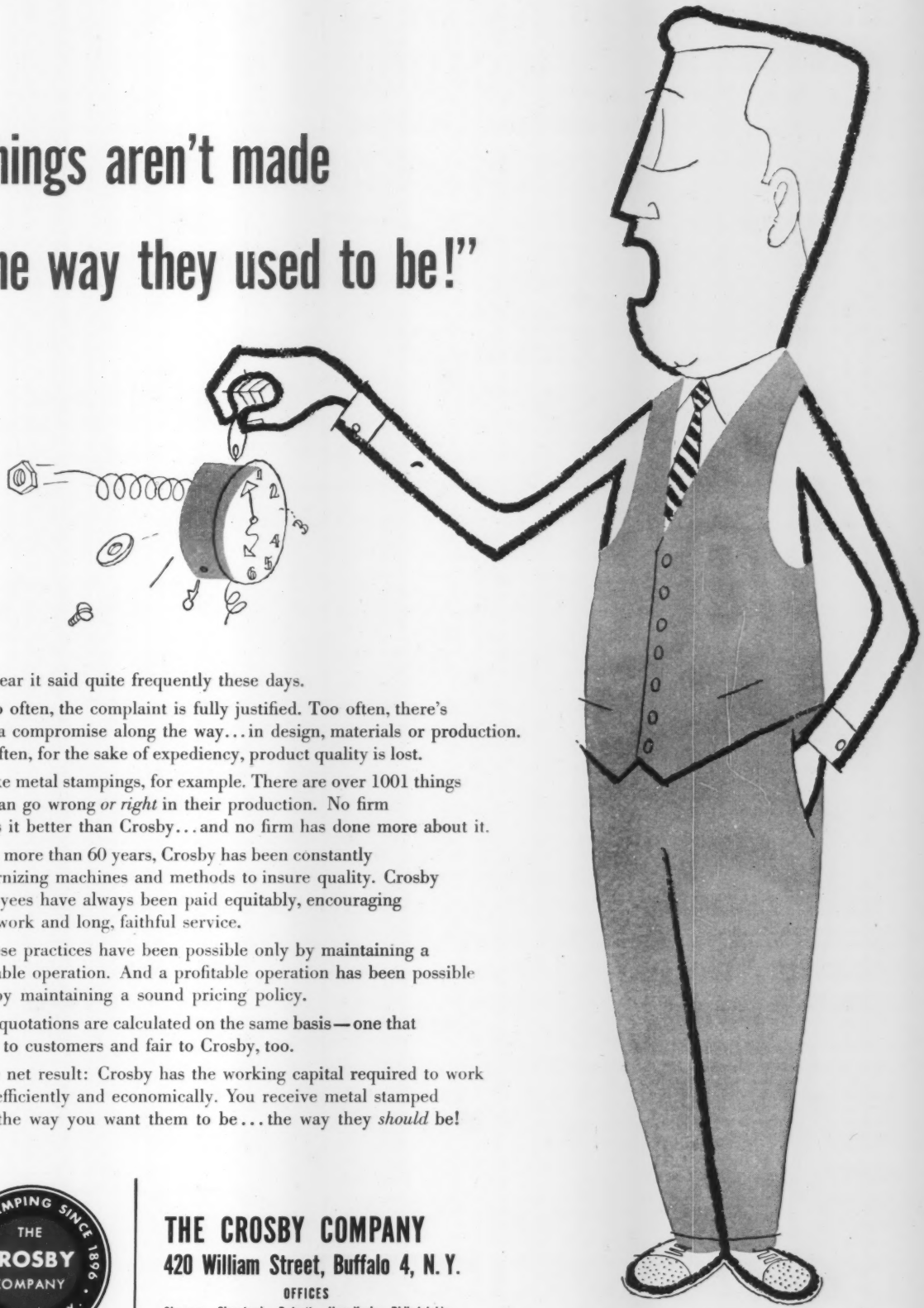
Helpful in Opening Doors

I should like to compliment you on the excellent 1957 Program for Management series and to thank you for forwarding reprints. I would appreciate 10 copies of the sixth article, "Research . . . Threshold to the Future." (July 15, Page 93).

I find your articles particularly helpful in opening doors that were previously closed because of the lack of com-

(Please turn to Page 12)

"things aren't made the way they used to be!"



You hear it said quite frequently these days.

Too often, the complaint is fully justified. Too often, there's been a compromise along the way... in design, materials or production. Too often, for the sake of expediency, product quality is lost.

Take metal stampings, for example. There are over 1001 things that can go wrong *or right* in their production. No firm knows it better than Crosby... and no firm has done more about it.

For more than 60 years, Crosby has been constantly modernizing machines and methods to insure quality. Crosby employees have always been paid equitably, encouraging good work and long, faithful service.

These practices have been possible only by maintaining a profitable operation. And a profitable operation has been possible only by maintaining a sound pricing policy.

All quotations are calculated on the same basis—one that is fair to customers and fair to Crosby, too.

The net result: Crosby has the working capital required to work most efficiently and economically. You receive metal stamped parts the way you want them to be... the way they *should* be!

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ATwater 2-2202

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E. L. Humston & Co.—WAlnut 5-9691

IOWA—Bonaparte
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AMherst 7-9773

MASSACHUSETTS—Cambridge
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MINNESOTA—Minneapolis
Minnesota Steel Sup. Co.—ATlantic 6273

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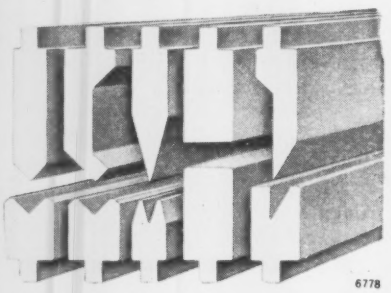
27
Dealers Offer Stock Deliveries

This country-wide organization of local dealers offers immediate delivery on many CHICAGO *induction hardened* press brake dies. These stock dies are economical, and the quick delivery saves time in tooling. They are available in any length from 4 to 12 feet in increments of 2 feet.

Stock dies are used for a surprisingly large variety of bending operations. And, with CHICAGO *induction hardened* dies you get bonus performance and increased die life at no extra cost. Remember, these dies can be used in any make or size of standard press brake.

On your needs for press brake dies, call your nearest dealer listed here. With Bulletin D-455 you can order by number. Ask for copy.



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*Induction hardening is a special, high-frequency process used to harden the wear surfaces of CHICAGO dies. Field reports on CHICAGO *induction hardened* dies show up to ten times longer life than conventional press brake dies.

CHICAGO DREIS & KRUMP

Press Brakes • Straight-Side-Type Presses • Press Brake Dies
Hand and Power Bending Brakes • Special Metal-Forming Machines

DREIS & KRUMP
MANUFACTURING CO.
7458 South Loomis Boulevard, Chicago 36, Illinois

LETTERS

(Concluded from Page 10)

munication. My own high regard for this series is reflected by the management of this company.

Your staff is to be congratulated on an outstanding job.

N. Altman
Product Sales Supervisor
Control
Division of Magnetics Inc.
Butler, Pa.

Editorial Is Good One

Your editorial, "The Right To Manage" (July 22, Page 55), is a good one. I would like 20 reprints.

James M. Straub
President
Fort Pitt Bridge Works
Pittsburgh

Helpful to Apprentices

We would like 25 copies of your article, "Guide to Carbide Tool Geometry" (July 8, Page 110). We believe these would be helpful to our apprentice class.

R. E. Hanes
Works Manager
Wheeling Works
Continental Foundry & Machine Div.
Blaw-Knox Co.
Wheeling, W. Va.

Aids Market Research

Please forward three copies of your Program for Management article, "Managing Our Markets" (June 17, Page 93). This should be helpful in my marketing research activities.

William MacKerell Jr.
Sales Analyst
Dresser Mfg. Div.
Dresser Industries Inc.
Bradford, Pa.

Most Informative Presentation

We have found your publication most interesting and wish to pass along our thanks to the editors for a most informative presentation in the article, "Tape Controls Inspection Machine" (May 27, Page 94).

E. C. Fuerst
Quality Control Manager
Photocopy-Xerox Equipment & Xerox Supplies
Haloid Co.
Rochester, N. Y.

Usage Wears Out Article

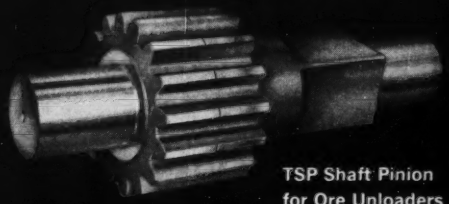
In the Aug. 16, 1954, issue, there was an article, "How To Reduce Selling Costs without Scuttling Your Sales Program" (Page 65). We have a copy of that article, but it is now quite worn and unreadable in parts. Even though it was published three years ago, is it possible to get a copy of it?

Mrs. Marilyn Stumph
Secretary to Sales Manager
Ewart Plant
Link-Belt Co.
Indianapolis

Interest in Missiles

Members of our research staff have shown much interest in the article, "Faster Shift to Missiles" (July 1, Page 38). We would like a reprint. It would be a welcome addition to our research library.

Mrs. Merle Danz
Librarian
Bureau of Business Research
University of Texas
Austin, Tex.

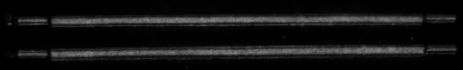


TSP Shaft Pinion
for Ore Unloaders

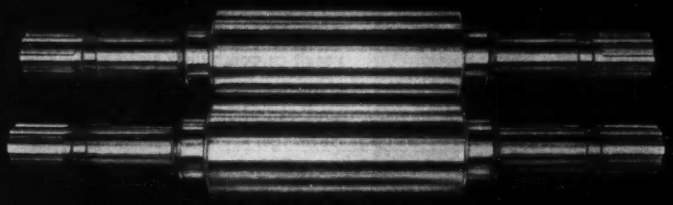
TSP Screw Down Screw and Nut for Blooming Mill

TSP Cone Crusher Gears

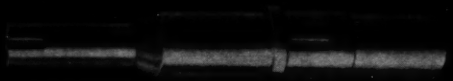
TSP Brake Wheels



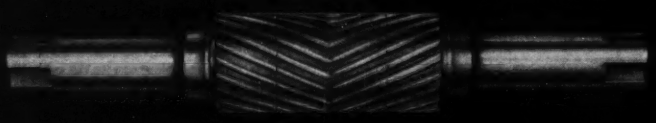
TSP Leveller Rolls for Steel Mills



TSP Rolls for Steel Mills

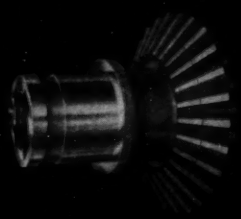


TSP Crane Wheel Axles

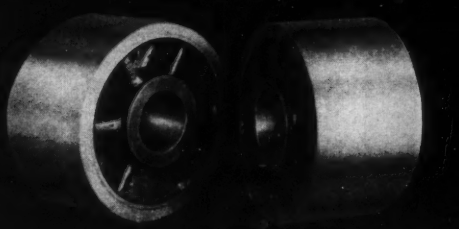


TSP Pinions for Steel Mills

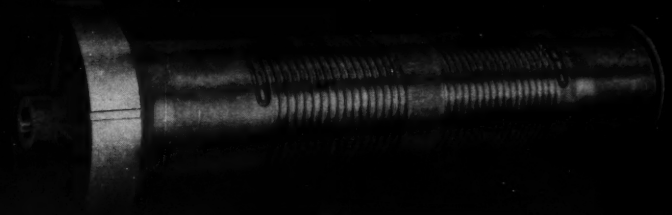
TSP Sprockets



TSP Edging Mill Bevel Gears



TSP Trunnion Rolls for Kilns



TSP Cable Drums for Cranes

TSP hardened parts can save you thousands of dollars

"Tool Steel Process" hardened parts give you savings in maintenance, replacement, and production.

TSP products are long wearing, need hardly ever be replaced . . . and are so carefully designed and made, that your equipment runs longer and more economically. In wide usage in practically every industry, they are guaranteed in writing to outlast, out-perform any competitive part in the same service. Their phenomenally long wearing qualities are a result of our special hardening process. The file hard surface to the full depth of permissible wear gives maximum life. The core, refined for toughness and ductility, gives maximum strength. Note the depth of hardness on gear tooth cross section.

TSP hardened parts, a few of which are illustrated, are made to order from your blueprints, or to fit existing equipment. Gears made in sizes to 90" diameter. Other products up to 20,000 lbs. weight. Write for Bulletin 352 "Why Are They Called TSP Products" and complete information about TSP applications for your equipment.

THE TOOL STEEL GEAR AND PINION CO.
CINCINNATI 16, OHIO, U. S. A.

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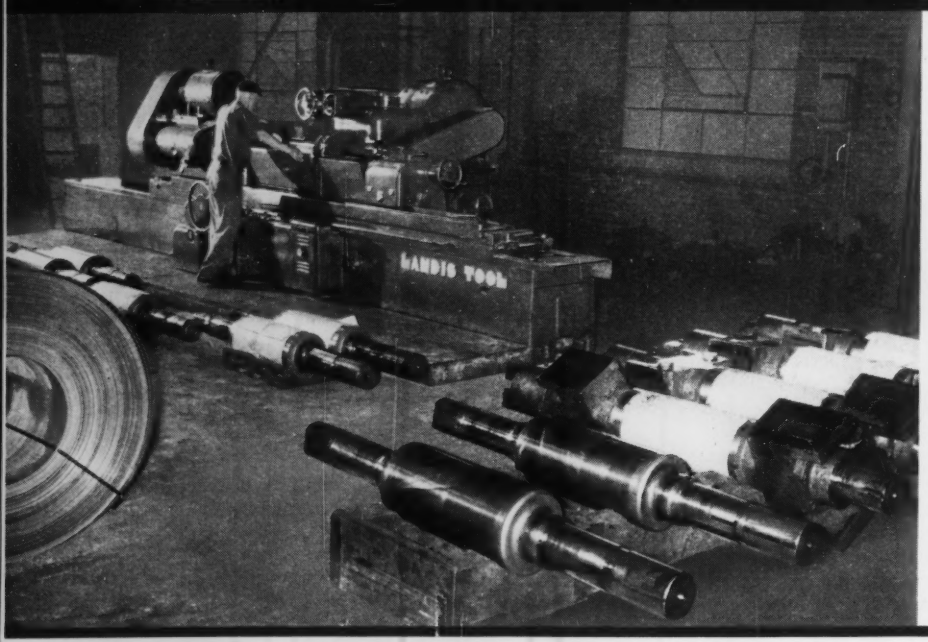
The Standard of Quality Since 1909 for Gears • Pinions • Rolls • Wheels and Other Hardened Products

Fast, accurate roll grinding from

You can get results like these from Landis precision features

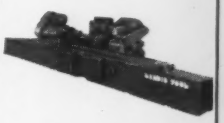
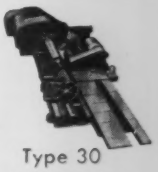
Mirror finishes like this are the result of combining rigid heavy machine parts, smooth vee belt drives, and Landis Microsphere Spindle Bearings.



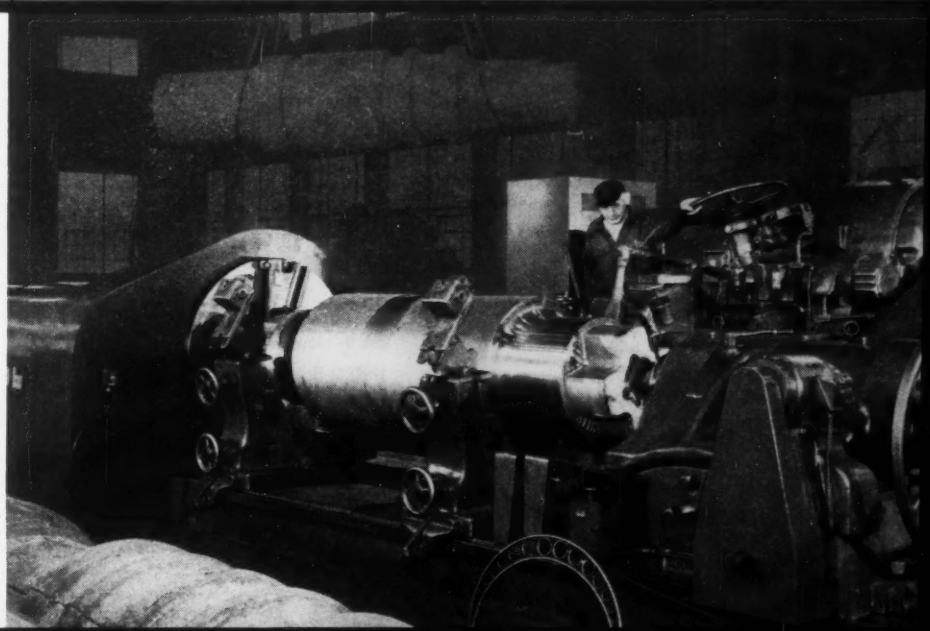
Easily duplicated accurate roll contours, from the Landis crowning and concaving mechanism. Ease of adjustment reduces setup time and eliminates cut and try methods.

LANDIS TOOL COMPANY / WAYNESBORO, PENNSYLVANIA

the Landis line of *precision* machines

Condensed specifications	Sine Bar Roll Grinder	 Type FR Roll Grinder	Type B Roll Grinder	 Type 30 Roll Grinder
Work swings	10″ & 14″	18″ & 24″	20″-24″-28″	36″-44″-50″-60″
Distances between centers	48″ to 72″	72″ to 240″	96″ to 192″	120″ to 288″
Standard grinding wheel size	14″ x 1½″	30″ x 3″	30″ x 3″	36″ x 4″
Work drive motor hp	1 hp	3 hp	7½ hp	36″-44″ 20 hp 50″-60″ 30 hp
Wheel drive motor hp	3/5 hp	25 hp	30 hp	40 hp

Ample power to start any roll within the capacity of the machine. Landis heavy beds and massive construction permit rough or finish grinding on all types of rolls.



LANDIS
precision grinders

Cold Heading Cuts Costs

Fasteners and Small Parts Show Big Savings

One of the most important cost cutting developments in recent years is the increasing use of cold headed fasteners and small parts throughout industry. Parts produced by this process show marked savings when compared to the same production on screw machines. The most obvious advantage is in the economical wire stock used in cold heading. The more expensive bar stock used in the screw machine method results in considerable waste, whereas the waste is almost negligible in cold heading.

Another important consideration is the greater strength structure of parts made by the cold heading method. The blow of the heading tool causes the grain structure of the metal to flow in lines of greater strength whereas the strong outer surface of the screw machine product has been reduced to scrap.

The possibilities of cold heading are almost unlimited when used in conjunction with secondary operations. The tremendous savings in operation and material costs make it a must consideration when designing small parts either as fasteners or as integral units for manufactured parts. It has been a long time policy of John Hassall, Inc. to support their cold heading equipment with the latest methods of secondary manufacture. Machines for roll threading, slotting, drilling, tapping and many other operations are available for your profit.

Given complete specifications, including a drawing and an idea of the application, we can quickly tell you whether or not it will be advantageous to have your fastener or part JOB-DESIGNED by HASSALL. The remaining important aspect of our service to you is the ability to get into production quickly and make prompt shipment.

Write for a copy of our new booklet, "What the Designer Should Know about Cold Heading."

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Manufacturers Since 1850

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Something new... made better by aluminum

Loaded aluminum cars were crashed together again and again at Aluminium Limited's laboratories in Kingston, Ontario. Even a million pounds of impact failed to damage these rugged cars.

New aluminum hopper cars withstand million-pound punch ...increase payloads up to 16%

WITH ITS GREAT SUCCESS in new passenger trains, it was natural to think of aluminum for freight cars. Aluminum cars would mean heavier payloads . . . trains 16% longer hauled by the same locomotive. Lightweight cars would also reduce track wear and switching costs. And, of course, aluminum's corrosion resistance would provide substantial maintenance savings.

Tests Prove Strength

But would aluminum cars be rugged enough for this service? The answer—a definitive *yes*—was uncovered by Aluminium Limited's research facilities. In recent tests aluminum hopper cars withstood up to a million pounds of impact . . . far more than is ever encountered in a lifetime of service.

Growing Fabricator Markets

With all these advantages, aluminum is sure to play an important role in modernization and replacement programs for America's fleets of 2,000,000 freight cars. With this and other structural applications, aluminum fabricators are sure to find ever-increasing markets.

Through research and engineering, Aluminium Limited is continually working to develop new uses and markets for aluminum. To match the growing demand, production capacity in Canada is expanding to reach a level of 1,000,000 tons annually by 1960.

Supplying U. S. industries with primary aluminum from Canada

Aluminium Limited *Sales, Inc.*

630 FIFTH AVENUE · NEW YORK 20, N. Y.

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ALBERT SAUVEUR *was the first man in America to study steel through a microscope. In that way he noted the relative effects of temperature, amount of work, cooling rate and chemical composition on the grain size of both rolled and forged steels.*

From these studies, Dr. Sauveur was able to show that there was a certain critical temperature which, following hot work and slow cooling, yielded the smallest grain size. This brought immediate modifications in rolling and forging procedures which, until then, had been done at the highest possible heat.

Thus, in 1896, began researches into the working and heat treatment of steel which form the basis of our present knowledge of metallurgy. In almost every branch of this science, Albert Sauveur contributed useful and important knowledge. Harvard University describes him as "a founder of the science of metallography". For this, and his life's work as scientist, teacher and our first consulting metallurgist, his is a great name among steel makers.

Great Names in Steel Making #VI

The same day Albert Sauveur first focused his microscope on a specimen of steel, a mill employee on the Monongahela was busy paddling heavy grease on the roll necks of a small hand mill. The grease, a fatty base material having a high melting point, had recently been compounded by The Ironsides Company, of Columbus, Ohio. It was called "Shield" and performed so well that the name "Shield" in time, became synonymous with satisfactory lubricants.

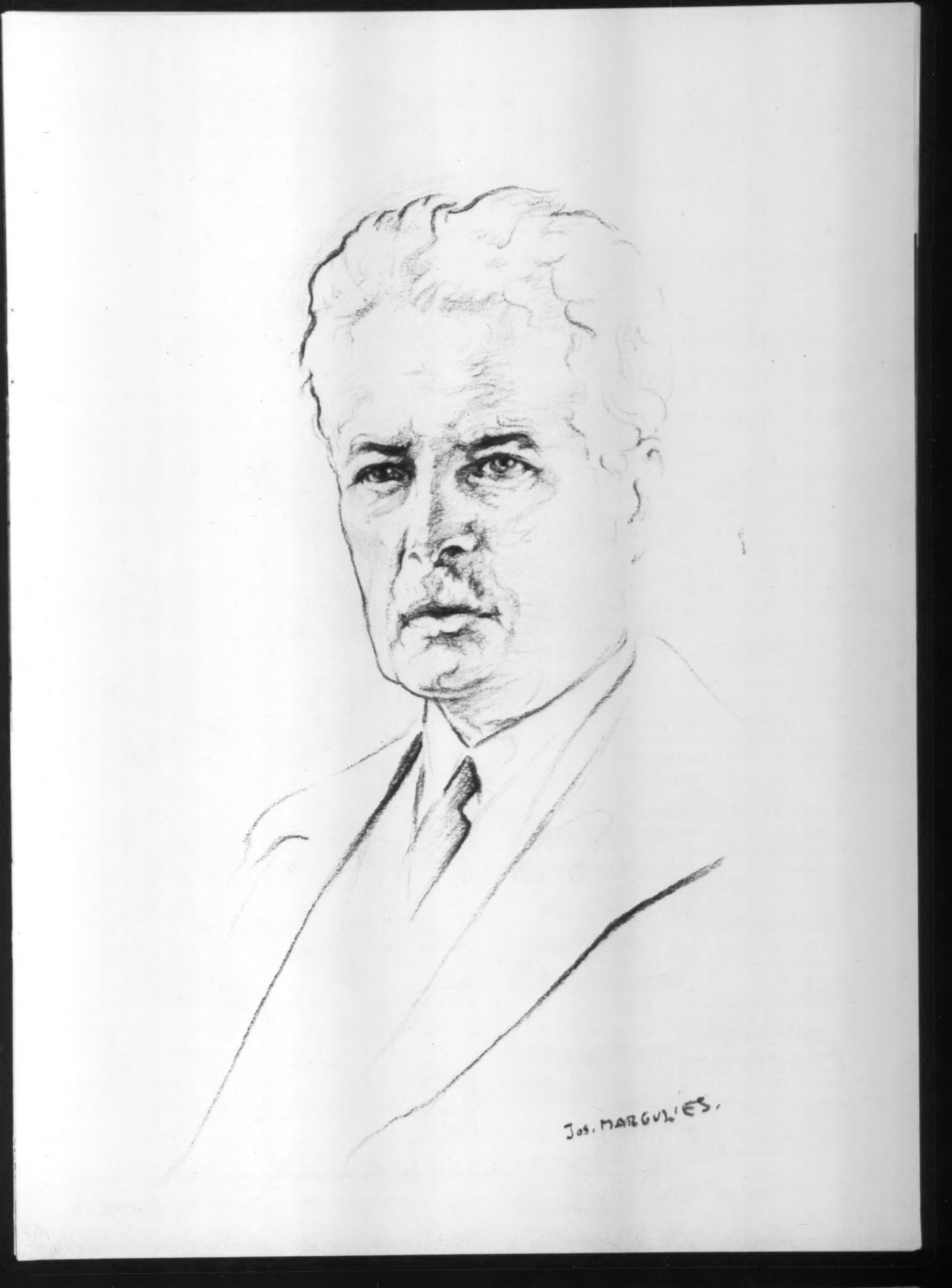
The work of steel makers and lubrication engineers has come a long way since then — from small, slow mills, greased by hand with a paddle, to today's four and five stand continuous mills requiring automatically applied lubricants able to support sustained mill speeds of 4300 fpm and pressures as high as 25,000 psi.

In this progress, Ironsides specialists have "teamed" with mill superintendents, lubrication engineers and rollers to solve numerous problems. To achieve a satisfactory roller bearing Shield, for example, it was necessary to develop a pumpable, water repellent, extreme pressure lubricant that was also free-running in order to minimize the enormous power consumption of modern rolling mills. The even tougher problem of producing a domestic roll oil to replace imported palm oil was licked by the development of Palmoshield.

Ironsides engineers are equally accustomed to studying the problems of individual mills and compounding lubricants for specific conditions and preferences. These "custom tailored" lubricants are supplied in any quantity, from pails to tank cars.

Do you have such a problem—or an interest in improving present lubrication performance? A letter, or phone call, will bring one of our research engineers. The Ironsides Company, Columbus 16, Ohio.

By the makers of Palmoshield
"the palm tree that grows in Ohio"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...of manganese with MANTEMP ferromanganese

This new exothermic manganese alloy allows open hearth melters to make higher additions of manganese to the ladle (up to 1.5% manganese). Thus you get:

- 10% to 15% higher recoveries of manganese.
- More consistent manganese recoveries with fewer missed heats.
- 15 to 20 minutes less furnace time for low-carbon heats.

The strong exothermic action of MANTEMP ferromanganese sharply reduces segregation of manganese within the ladle. In addition, its unique exothermic reaction allows higher and more consistent recoveries of aluminum when aluminum is added as an alloying element.

Your nearest ELECTROMET office will be glad to give you further information concerning the high and medium-carbon grades of MANTEMP exothermic ferromanganese. Write ELECTRO METALLURGICAL COMPANY, Division of Union Carbide Corporation, 30 E. 42nd St., New York 17, N.Y.

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FERRO-ALLOYS AND METALS

UNION CARBIDE

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ALEMITE®

YOUR ONE DEPENDABLE SOURCE FOR ALL THESE VITAL PRODUCTS:

1. Lubrication Equipment
2. Spray Pump Equipment
3. Hydraulic Hose, Couplings

. . . with nation-wide service and training programs to back up the products!

Cut Lubrication Costs up to 64%! Alemite offers the widest choice of lubrication fittings on the market—time-saving pumps and guns for handling of lubricants—fully automatic airborne mist lubrications systems—centralized systems for both oil and grease.

Apply Materials 30% Faster!—If you use any material that is received in a drum—paint, putty, caulking, even food products . . . Alemite can pump direct from the drum to point of application for spraying, extruding, transfering, packaging!

Protect Hydraulic Systems!—Alemite offers a complete line of non-skive, reusable high pressure hose and couplings for *any* hydraulic system.

And Alemite backs up these products with service points from coast to coast—with free training programs and plant surveys that will save money for *your* company!

For free catalogs and complete information, write Alemite, Dept. H-87, 1850 Diversey Parkway, Chicago 14, Ill.

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Alemite is the only *single source* for all these famous products:

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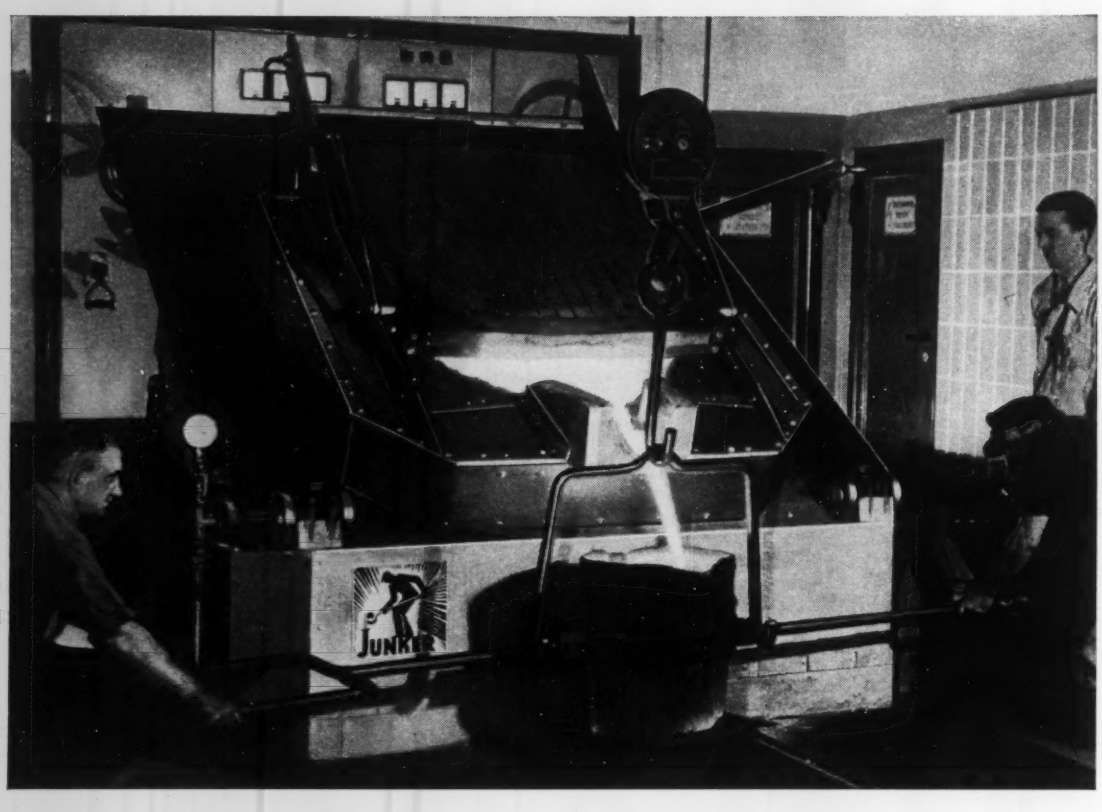
"BARREL-TO-BEARING"	Manual and Power Operated Pumps and Guns
Spray Pump Equipment	ALEMITE Versatal SPRAY PUMP EQUIPMENT
"SURGEPRUF"	Hydraulic Hose and Couplings



A NEW METALLURGICAL TOOL FOR THE PRODUCTION OF HIGH QUALITY CAST IRON

We offer to the American industry the AJAX-JUNKER 60 cycle coreless induction furnace for melting or superheating cast iron, and particularly for the production of ductile cast iron. The AJAX-JUNKER is economical in foundries with intermittent operation and frequent alloy changes. It melts loose turnings with high recovery.

Electromagnetic stirring of the melt enables close control of composition. It speeds up the recarburizing rate and the solution of alloy ingredients.

High temperatures required for many quality castings are easily attained. Uniform heat is generated within the melt and the furnace lining is at a lower temperature.

The photograph shows a 6-ton Junker coreless induction furnace in a German foundry.

May we explore the possibilities of this new method with you?

AJAX USA

60 CYCLE INDUCTION MELTING

ENGINEERING CORPORATION

TRENTON 7, NEW JERSEY

Associated Companies: Ajax Electrothermic Corporation Ajax Electric Company

CALENDAR
OF MEETINGS

Aug. 20-23, Western Electronic Show & Convention: Cow Palace, San Francisco. Information: WESCON, 342 N. LaBrea, Los Angeles 36, Calif.

Aug. 28-30, American Institute of Electrical Engineers: Pacific general meeting, Chinook hotel, Yakima, Wash. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Sept. 8-11, National Metal Trades Association: Eastern plant management conference, Essex-Sussex hotel, Spring Lake, N. J. Association's address: 337 W. Madison St., Chicago 6, Ill. Secretary: Charles L. Blatchford.

Sept. 9-11, American Mining Congress: Metals mining and industrial minerals convention, Utah and Newhouse hotels, Salt Lake City, Utah. Congress' address: 1102 Ring Bldg., Washington 6, D. C. Executive vice president and secretary: Julian D. Conover.

Sept. 9-12, Society of Automotive Engineers: Tractor meeting and production forum, Hotel Schroeder, Milwaukee. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Sept. 9-13, Instrument Society of America: Annual instrument - automation conference and exhibit, Public Auditorium, Cleveland. Society's address: 313 Sixth Ave., Pittsburgh 22, Pa. Executive director: William H. Kushnick.

Sept. 12-14, Automotive Parts Rebuilders Association: Annual meeting and exhibit, Congress hotel, Chicago. Association's address: 220 S. State St., Chicago 4, Ill. Executive secretary: Jack O'Sullivan.

Sept. 17-18, Electronics Industries Association: National technical machine tool automation meeting, Ambassador hotel, Los Angeles, Calif. Association's address: 1721 DeSales St. N.W., Washington 6, D. C. Secretary: James D. Secrest.

Sept. 17-20, American Die Casting Institute: Annual meeting, Edgewater Beach hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Laine.

Sept. 18-20, National Industrial Conference Board: Marketing meeting, Waldorf-Astoria hotel, New York. Board's address: 460 Park Ave., New York 22, N. Y. Secretary: Herbert S. Briggs.

Sept. 20, Malleable Founders' Society: Fall meeting, Hotel Cleveland, Cleveland. Society's address: 1800 Union Commerce Bldg., Cleveland 14, O. Executive vice president: Lowell D. Ryan.

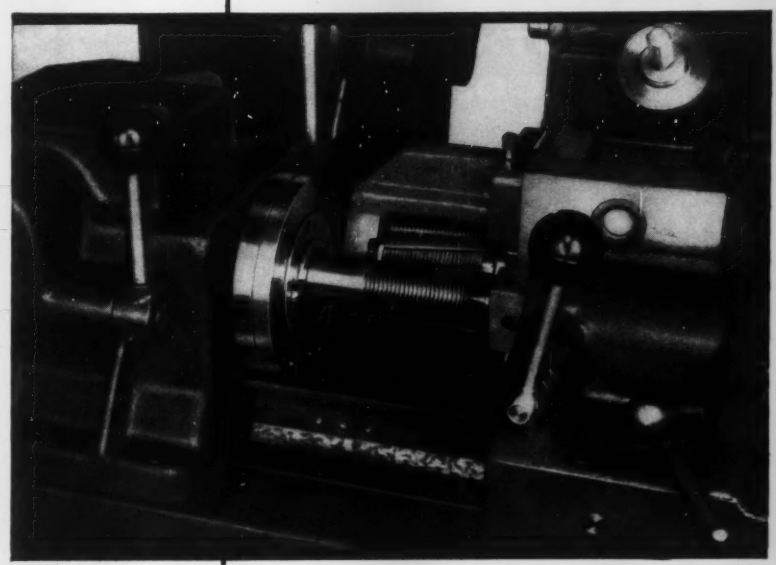
Sept. 21-24, Steel Founders' Society of America: Fall meeting, Homestead, Hot Springs, Va. Society's address: 606 Terminal Tower, Cleveland 13, O. Secretary: George K. Dreher.

Sept. 22-24, American Machine Tool Distributors Association: Annual meeting, Hotel Cleveland, Cleveland. Association's address: 1900 Arch St., Philadelphia 3, Pa. General manager: James C. Kelly.

Sept. 22-25, American Institute of Wholesale Plumbing & Heating Supply Association Inc.: Annual meeting, Waldorf-Astoria hotel, New York. Institute's address: 402 Albee Bldg., Washington 5, D. C. Executive secretary: George T. Underwood.

Sept. 23-25, American Society of Mechanical Engineers: Fall meeting, Hotel Statler, Hartford, Conn. Society's address: 29 W. 39th St., New York 18, N.Y. Secretary: C. E. Davies.

ONE
GOOD TURN



Hanson-Whitney Thread Milling Machines produce precision threads with *one turn* of the work. Featuring precision cutting of internal or external, straight or taper, left or right hand threads, H-W's great versatility boosts your production profit.

The Hanson-Whitney Thread Milling Machine features an exclusive cam design eliminating back lash, and providing a full automatic cycle for lead and depth plus rapid retraction, which speeds gaging and loading.

Hanson-Whitney's *single source* production integrity covers their complete line of machine and cutting tools, fixtures and precision gages. Consult H-W's complete home and field engineering service on all threading problems.

Hanson-Whitney
COMPANY

Division of THE WHITNEY CHAIN COMPANY
178 BARTHOLOMEW AVE., HARTFORD 2, CONN.

TAPS : THREAD GAGES : HOBS : CENTERING MACHINES : THREAD MILLING MACHINES AND CUTTERS

How **DENISON** hydraulic power works for **LOGEMANN BROTHERS CO.**

Putting more squeeze in presses

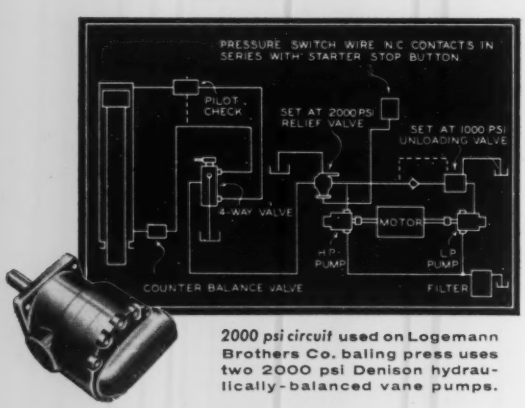
...another application for Denison hydraulic power

Here's how a leading manufacturer of baling presses assures peak performance for his product . . . combines it with dependability for long, continuous service.

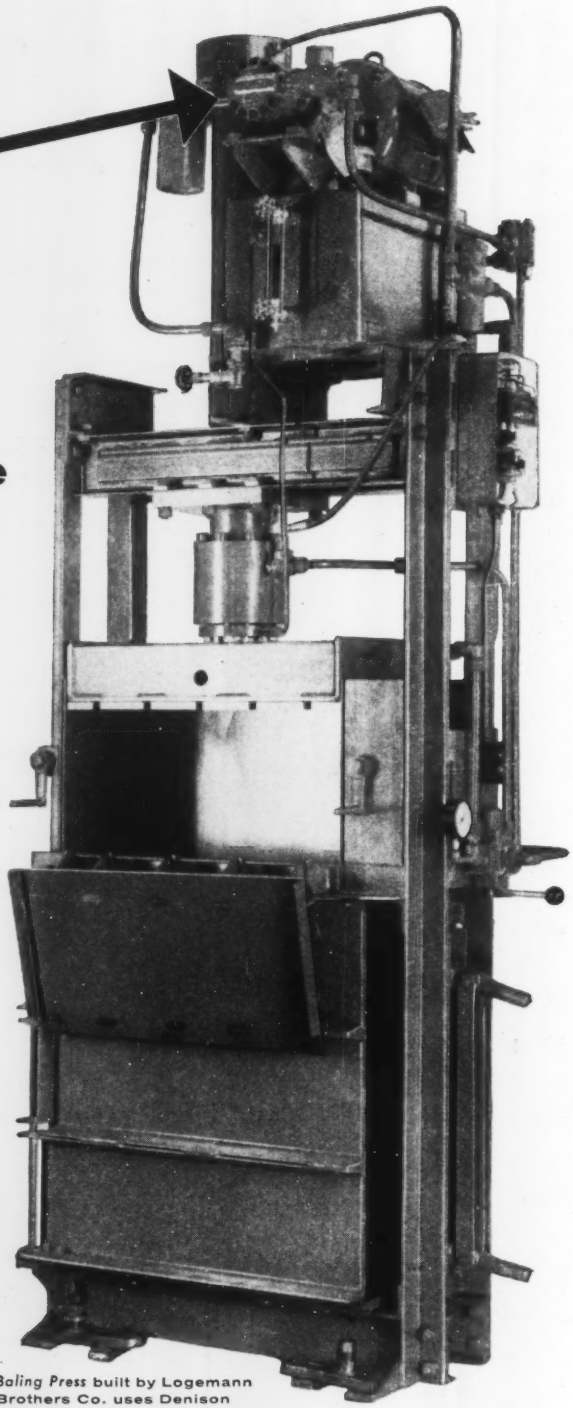
Power and speed of operation are achieved by the use of two 2000 psi Denison TMC balanced-vane hydraulic pumps. One Denison pump is set for 1000 psi for fast ram approach. The second pump is set for 2000 psi to provide necessary pressure for the power stroke.

By using identical 2000 psi pumps, maintenance is simplified and pump life greatly increased.

Endless design problems can be solved by using Denison hydraulic equipment on systems up to 5000 psi. Your Denison representative (who is an experienced hydraulic specialist) will gladly show you how. Write us. Denison Engineering Division, American Brake Shoe Co., 1180 Dublin Road, Columbus 16, Ohio.



***2000 psi circuit* used on Logemann Brothers Co. baling press uses two 2000 psi Denison hydraulically-balanced vane pumps.**



***Baling Press* built by Logemann Brothers Co. uses Denison pumps and valves for 2000 psi hydraulic system.**

Denison and Denison HydrOILics are registered trademarks of Denison Eng. Div., ABSCO

HYDRAULIC PRESSES • PUMPS • MOTORS • CONTROLS

DENISON HydrOILics

How a year in the Antarctic proved that USS "T-1" Steel "can really take it"

THE SKIS on these gigantic 10½-ton sleds are made of USS "T-1" Steel. Over a year ago, 38 of the sleds went into service as cargo carriers for the Navy's OPERATION DEEP FREEZE in Antarctica. During that time they have been subjected to temperatures around 69° below zero. Towed by powerful tractors, they have scraped and gouged—400 miles in a single trip—across the rock-hard ice of the South Polar Plateau. And each sled has carried up to 20 tons of cargo per trip.

What has been the effect of this severe service on the skis of USS "T-1" Steel? None. They have remained strong and tough, despite the bitter sub-zero temperatures. No brittleness. No failure. USS "T-1" Steel's hardness has successfully resisted the tremendous abrasive properties of crusted snow and ice. Its toughness has prevented low-temperature impact failure. What's more, its very high yield strength (90,000 psi minimum) permitted the skis to be fabricated from ¼" USS "T-1" Steel plate. Thus, the skis were built *lighter*, yet *stronger*.

The USS "T-1" Steel skis are 154 inches long and 34 inches wide, were cold-formed on a brake press in the shape of troughs. Then the front and back ends of the troughs were notched at the outer line by gas cutting, formed up and together, then welded to make the curved front and back ends of the skis. Welding was done with E-12015 rod.

USS "T-1" Steel is being used to increase strength and durability, while reducing weight and costs in a wide variety of applications from bridge construction to mining equipment. For complete information, write to United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

Sleighs being assembled at landing point in Antarctica. The massive sleighs were designed jointly by the U. S. Navy and Otaco, Limited, of Orillia, Ontario, Canada.

OPERATION DEEP FREEZE

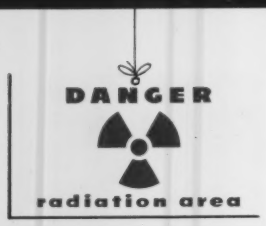
During the present International Geophysical Year (1957-1958), American scientists, with the support of the United States Navy, will, through research at Antarctica, endeavor to advance the world's knowledge of meteorology, glaciology, ionospheric physics, geomagnetism, aurora and air glow, cosmic rays, seismology and gravity.

USS "T-1" CONSTRUCTIONAL ALLOY STEEL

"USS" and "T-1" are registered trademarks.

UNITED STATES STEEL

United States Steel Corporation, Pittsburgh · Columbia-Geneva Steel Division, San Francisco · Tennessee Coal & Iron Division, Fairfield, Ala.
United States Steel Supply Division, Warehouse Distributors, Coast-to-Coast
United States Steel Export Company, New York



Pressurizer for designed with stainless

The reactor we are talking about contains a fissionable nuclear core through which passes thousands of gallons of water per minute at elevated temperature and pressure. This pressurized radioactive water transfers heat from the reactor core to a shell-and-tube-type steam generator which in turn produces non-radioactive steam in the secondary system for power turbine operation.

As power requirements change, the temperature of the primary water is maintained by moving neutron-absorbing reactor control rods in or out of the reactor. Resulting pressure and volumetric changes of the primary water system must be controlled, and this is the job of the pressurizer vessel.

When the primary system water pressure drops, high-capacity back-up immersion heaters at the bottom of the pressurizer go into action to heat the water and generate more steam and maintain pressure. When the primary system pressure goes *up*, water sprays inside the pressurizer are activated to collapse the steam bubble, thus reducing the pressure and permitting positive water surges from the primary system. Since the walls are alternately exposed to wetted and vaporous conditions at high temperatures, a severely corrosive environment exists. Corrosion in this vessel could result in a hazardous level of radioactivity throughout the primary side of the plant. The choice of a proper steel to insure against this hazard was a major consideration. This is why the pressurizer was designed with stainless steel.

Electric furnace and metallurgical staffs worked together to obtain the precise chemical composition specified. Great care was taken during processing in the electric furnace shop. Then, forge press crews, heat treaters and machinists combined skills to produce the finished rings, which certainly rank among the finest USS Quality Forgings ever produced.

Your USS Quality Forging order makes use of the same steel-making facilities, the same processing equipment, and most important: your forging is made by the same skilled workmen in our Homestead Forgings Division.

If you'd like to inquire about a USS Quality Forging made under these conditions, or if you'd like our free 32-page booklet on the subject, please write to United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

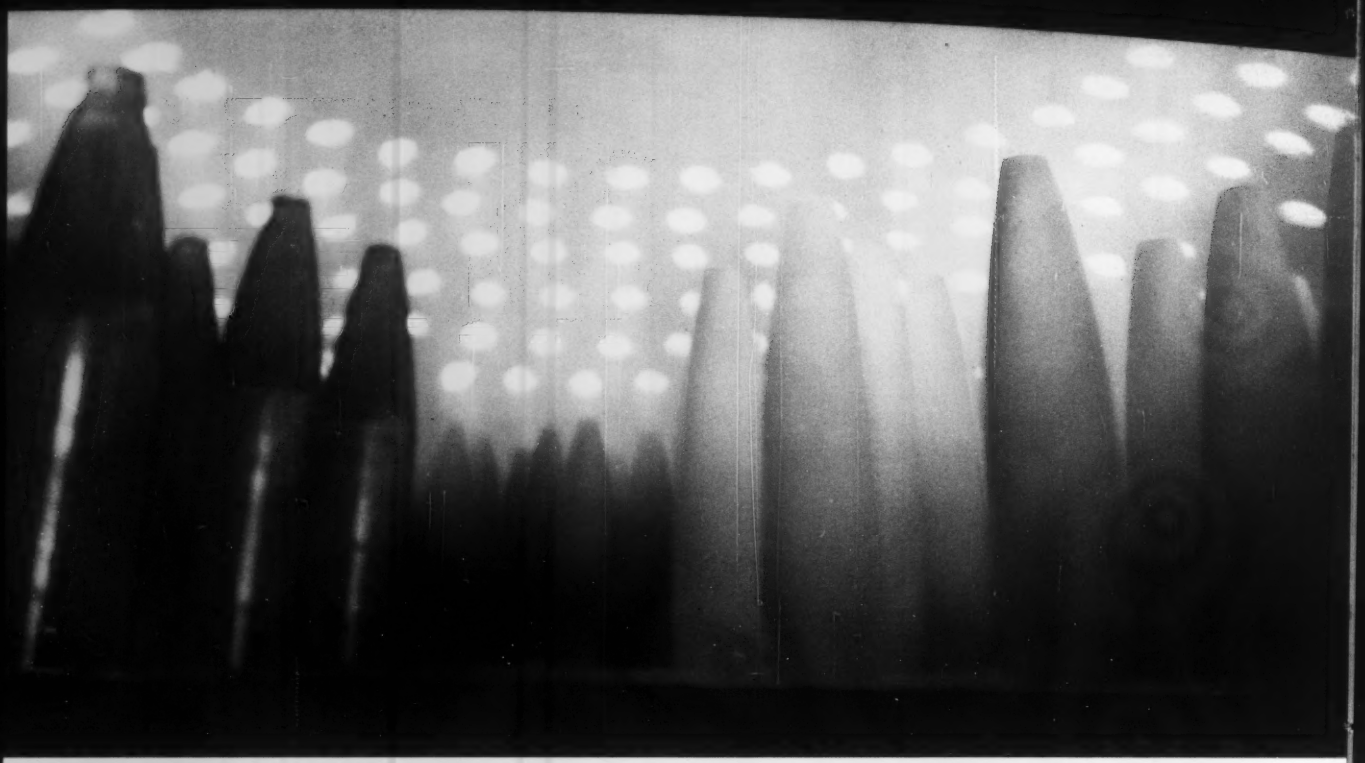
USS
QUALITY
FORGINGS

heavy machinery parts... carbon, alloy, stainless
forged steel rolls and back-up roll sleeves
electrical and water wheel shafts
specialty forgings of all types

UNITED STATES STEEL

nuclear reactor system steel USS Quality Forgings

To meet rugged service conditions– a refractory concrete dome made with ATLAS LUMNITE* CEMENT



Three-year service life was obtained at this plant by a previous furnace dome made with the same materials. This 17′ diameter hardening and annealing furnace inner dome is made with a castable refractory containing Atlas Lumnite cement — A.P. Green "Kast-Set." Heat passes through 289 easily formed 5" round holes, heating concrete on both sides. Installed by Lindberg Combustion, Chicago, Ill., for the Englander Co., Inc., Birmingham, Ala.

- Lumnite-made refractory concrete resists extreme variations in temperature and thermal shock due to rapid heating and cooling.
- Durability under severe operating conditions is assured.
- Placement is fast and easy — service strength is reached within 24 hours.

For maximum convenience, use Lumnite-made castables. These are pre-mixed, ready for use, and are made by leading manufacturers of refractories. For more information, write: Universal Atlas, 100 Park Avenue, New York 17, N. Y.

UNIVERSAL ATLAS CEMENTS

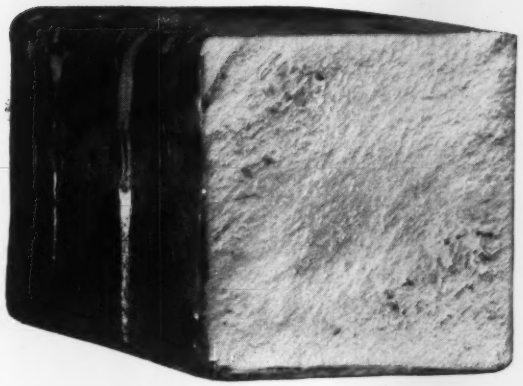
USS

* **"LUMNITE"** is the registered trademark of the calcium-aluminate cement manufactured by Universal Atlas Cement Company.

L-145

UNIVERSAL ATLAS CEMENT COMPANY—member of the industrial family that serves the nation—**UNITED STATES STEEL**

OFFICES: *Albany · Birmingham · Boston · Chicago · Dayton · Kansas City · Milwaukee · Minneapolis · New York · Philadelphia · Pittsburgh · St. Louis · Waco*



POROSITY

CAN'T HIDE BEHIND THIS SQUARE CUT

—WHEN YOU DIVIDE YOUR FORGING STOCK WITH A "BUFFALO" BILLET SHEAR

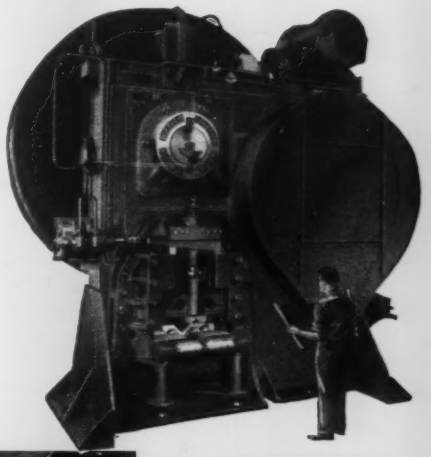
The time to detect porosity or "pipes" in your stock is *before* the forging, not afterwards, and that's one of many ways "Buffalo" Billet Shears save money.

The knives penetrate only $\frac{3}{16}$", localizing a sharp, vertical fracture — perfectly square, without the "smearing" present on sawed or burned faces. This enhances visual inspection and prevents many a forging "reject".

Other savings with "Buffalo" Billet Shears are high cutting speeds — elimination of gas and burner expense — maintenance of uniform weight in billets — and minimum operating cost over the years.

11 sizes are ready to meet your needs, the smallest handling 2¼" rounds or 2" squares at 30 strokes per minute — the largest handling 10" rounds or 9" squares at 6 strokes per minute. All have the "Q" Factor* of engineering and workmanship that provides trouble-free satisfaction and long life in every "Buffalo" product. Write for Bulletin 3295-C and see how these Quality features can save you money.

**The "Q" Factor—the built-in Quality which provides trouble-free satisfaction and long life.*



540 PER HOUR!

That's the output of a "Buffalo" No. 15 Billet Shear dividing 7" square stock in a large plant. Machine has automatic feed table and back gage. Above is a No. 17 Shear, largest in the line.

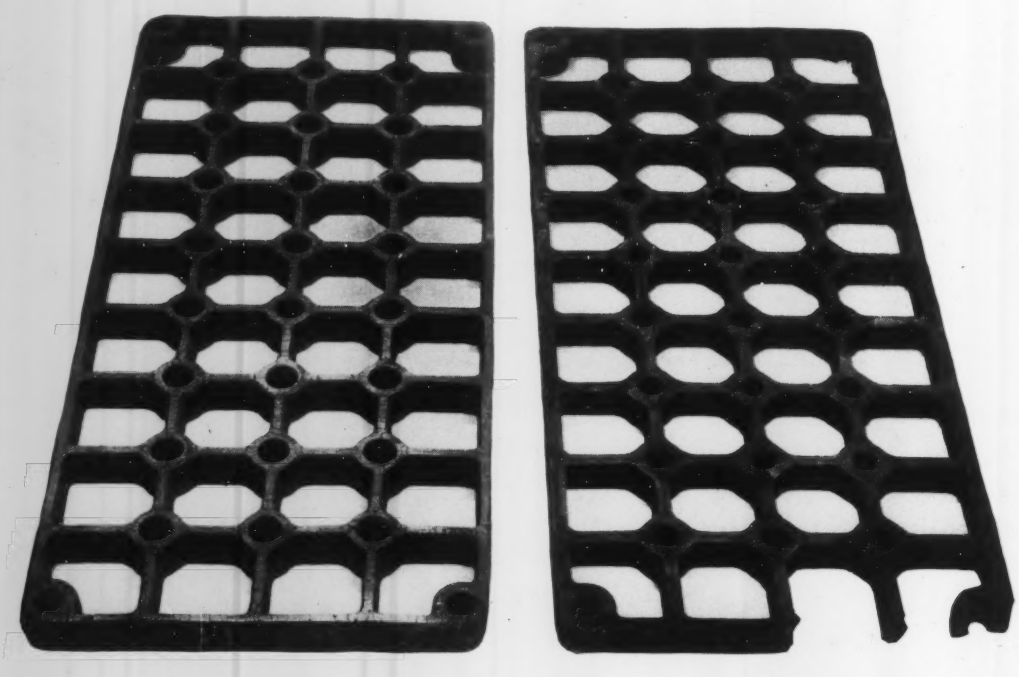
BUFFALO FORGE COMPANY

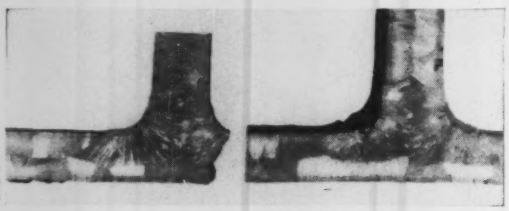
158 Mortimer Street • Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING SHEARING BENDING

THE TALE OF TWO TRAYS





THERMALLOY TRAY—hot acid etch made after removal from service. Note that through proper chilling and foundry practice, most cracks are superficial.

COMPETITIVE TRAY—hot acid etch after failure shows severe shrinkage and cracking. This tray was in service *less than half* as long as the Thermalloy tray.

THERMALLOY* QUENCH TRAY
GIVES TWICE THE SERVICE LIFE

At a major automotive plant, two sets of quench trays were recently ordered for carburizing shafts at 1650 F. Both were of standard design. One set was cast by Electro-Alloys of Thermalloy heat-resistant alloy—the other was a competitive make.

The illustrations above clearly show the condition of the two test trays . . . after the Thermalloy trays had been in service *more than twice as long* as the competitive make. Use of chills at critical points and proper foundry technique in the Thermalloy trays accounted for their much longer service life . . . by eliminating the shrinkage evident in the competitive tray. This test, made by the customer, clearly proved the added quality and strength achieved through the use of chills.

Whatever *your* heat-treat problem, it pays to make use of Electro-Alloys casting know-how—plus the outstanding physical properties of Thermalloy high-heat-resistant alloys.

For further technical information on Thermalloy Heat-Treat Trays, write for Bulletin T-227 . . . Electro-Alloys Division, [illegible] Taylor Street, Elyria, Ohio.

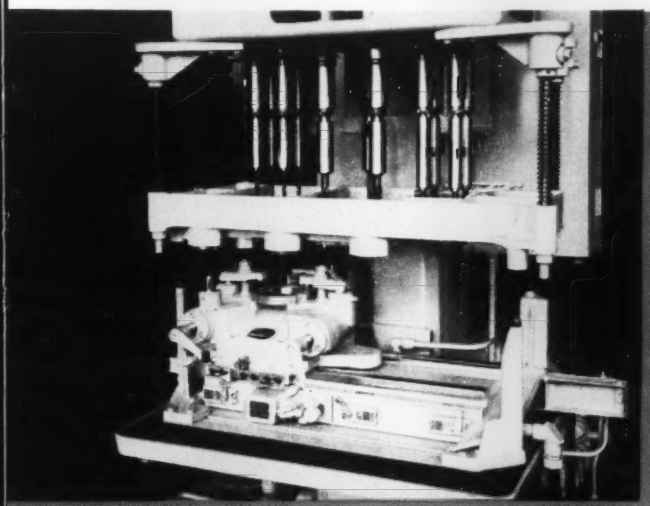
*Reg. U. S. Pat. Off.

AMERICAN Brake Shoe COMPANY **ELECTRO-ALLOYS DIVISION** Elyria, Ohio

Natco Naturals

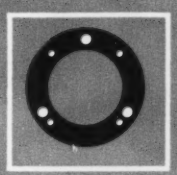
Cost-Cutting Ways
You Can Use
Standard Multi-Spindle Natcos

Any time your parts require machining *more than one hole*–drill, bore, face or tap–it may well be a "Natco Natural." Your standard Natco will produce substantial savings in a surprising number of situations, *even in small job-shop lots!* Call in your nearby Natco field engineer; he'll tell you in short order whether you've got a "Natco Natural" there.

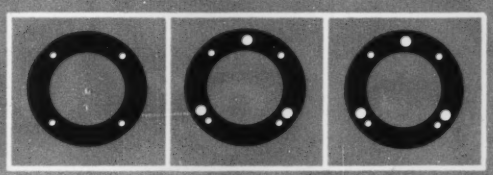


Multiple Drilling Operations on One Part-Face

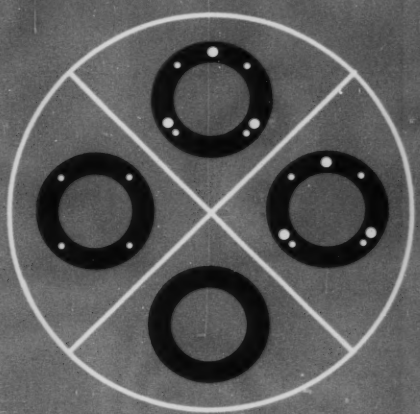
Straight-line indexing *on a Natco H6 produces 49 parts per hour. 4 holes drilled in first position, 3 holes drilled in second position, 4 holes c'bored in third position. One part completed every three strokes. Automatic cycling frees operator for other work. Illustrations below show three other ways of handling this part.*



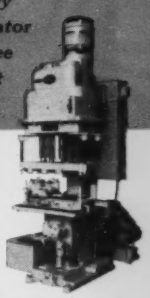
45 parts per hour. *Inexpensive box jig. Operator positions jig under appropriate spindles. One complete part for 3 strokes of machine.*



75 parts per hour. *3-position fixture. Operator shifts parts after each stroke. One part completed every stroke.*



155 parts per hour. *Rotary 4-position index table. Operator unloads and loads while three operations proceed. One part completed every stroke.*



Standard multi-spindle Natcos *range from 1 hp, 10-spindle machines to 25 hp machines with up to 72 spindles. Spindles in standard Natcos are driven through universal joints and located by either adjustable arms or bored slip plates.*

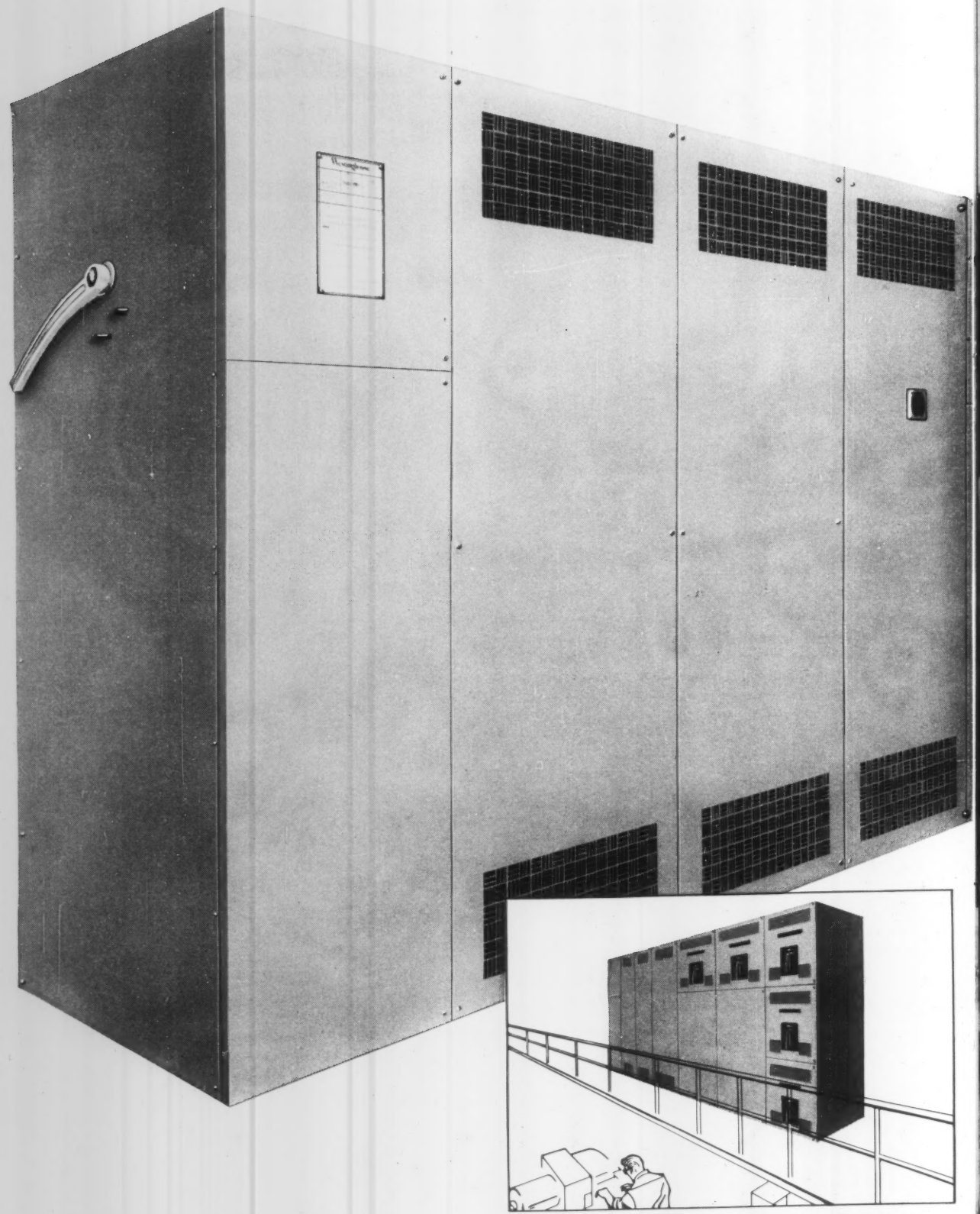
NATCO

National Automatic Tool Company, Inc.

Richmond, Indiana

Multi-spindle drilling, boring, facing & tapping machines. Special machines for automatic production.

Call Natco Offices in Chicago, Detroit, New York, Buffalo, Boston, Philadelphia, Cleveland, Los Angeles; distributors in other cities.

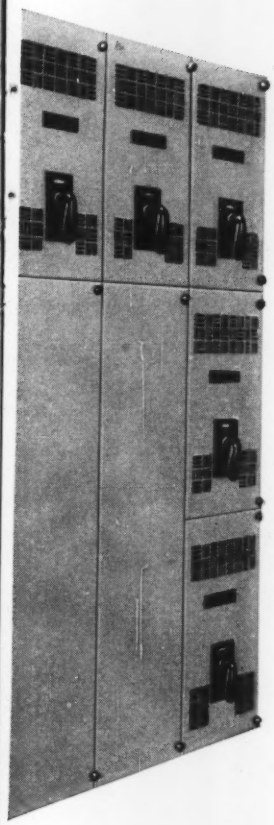


BALCONY or mezzanine installations save floor space, put power closer to load.

Long bus runs are expensive

for utilization voltage

YOU'LL SAVE WITH POWER CENTER CLOSE TO LOAD



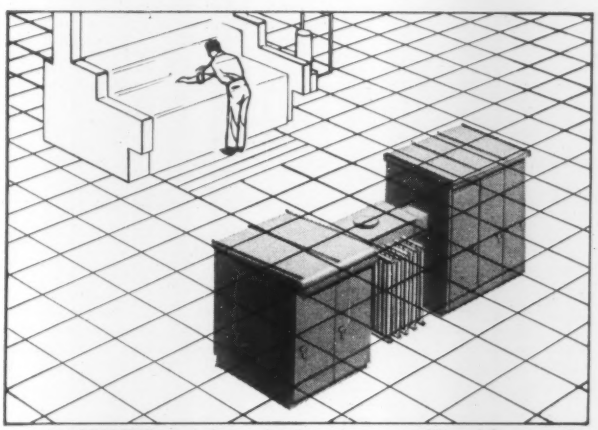
The cost of distributing power at utilization voltage in your plant can—and does—run into fancy red ink figures. Line losses multiply. Voltage drops. Motors run hot—heaters run cool—lighting efficiency fades.

Westinghouse power centers can stop these losses and, depending on the size of your operation, the savings can pay for the initial investment in a surprisingly few months.

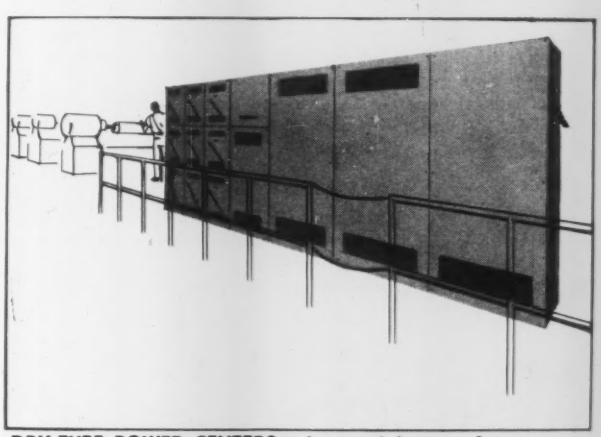
Westinghouse dry-type power centers are lighter. You can put them in the basement, put them on mezzanines—get closer to load, save space. They're packaged—transformer, breakers and associated equipment all factory assembled to specification—ready to set down and connect. They're simple to maintain—no liquids to reclaim, drain and replace. They're fire-safe—safer for personnel—more reliable for continuity and protection.

You can't afford not to expand or modernize your plant power distribution with power centers. Get the whole story from your Westinghouse sales representative—or your electrical contractor. Or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania, requesting *new* D. B. 34-150. J-60902

YOU CAN BE SURE...IF IT'S Westinghouse



BASEMENT or underground vault may utilize either ventilated or sealed dry-type power center.



DRY-TYPE POWER CENTERS take a minimum of space even when placed in the middle of production areas.

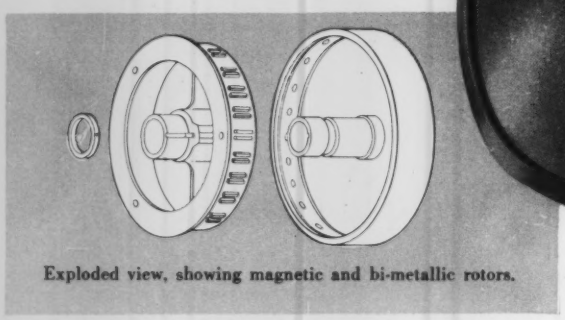
Announcing... AN OUTSTANDING NEW PROTECTIVE DRIVE!

WHITNEY-TORMAG MAGNETIC DRIVE . . .

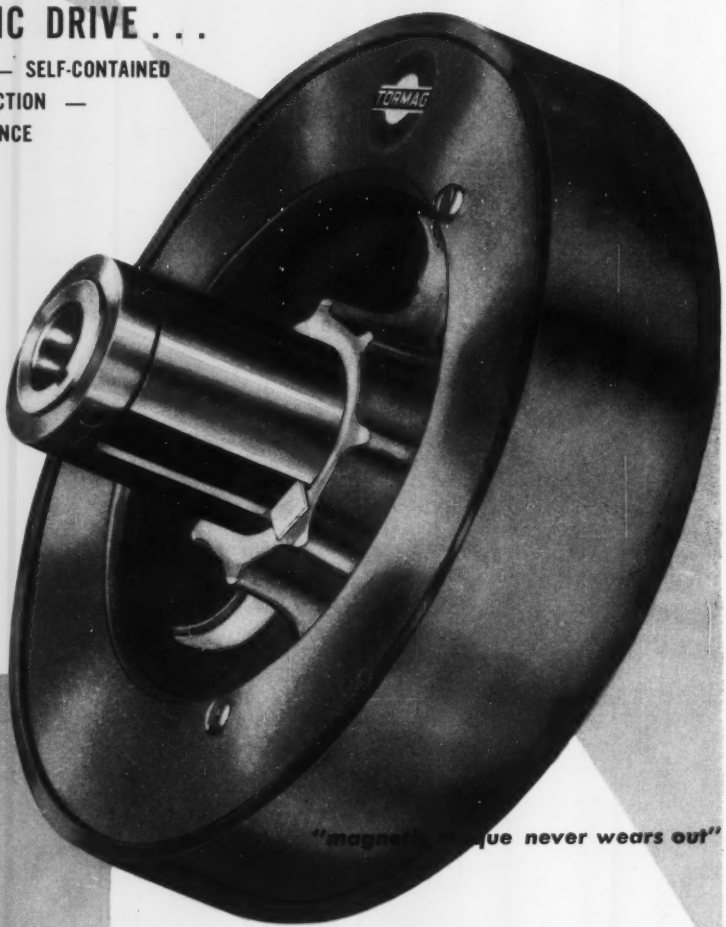
CUSHIONED STARTS — OVER 90% EFFICIENCY — SELF-CONTAINED — TORQUE RATED — FULL OVERLOAD PROTECTION — SLASHES POWER COSTS — ELIMINATES MAINTENANCE

Proven by successful applications throughout industry, the new Whitney-Tormag Magnetic Drive is a frictionless, permanent magnet type power transfer unit to be offered in a range of 3 ft. lbs. to 45 ft. lbs. and providing efficiency and economy never before attained. Design is uniquely simple, consisting of 2 basic parts—a permanent magnetic rotor and a bi-metallic rotor, mounted with an airgap between them. *Driving and driven rotors are never in contact*—torque induced by magnetic force and eddy currents transmits power through the airgap.

Whitney-Tormag Magnetic Drives are now being produced as a standard stock product in 1 and 2 H.P. (at 1750 R.P.M. input) sizes for sale through Whitney Distributors, with deliveries commencing in September, 1957. Additional sizes, up to and including 15 H.P. at 1750 R.P.M. input will follow initial production.



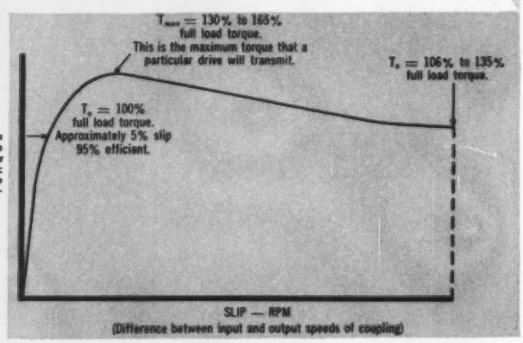
Exploded view, showing magnetic and bi-metallic rotors.



"magnetic ... que never wears out"

THESE FEATURES REDUCE YOUR COSTS . . . INCREASE OPERATING PROFITS!

- Runs at full stall (100% slip) indefinitely under normal conditions without harm to unit, motor, or driven element. No overheating danger.
- No power loss in fluids, particles or seal friction . . . no pumps, coolers or exciters to cause power drain.
- Meets new N.E.M.A. frame specifications—compact, ready to install in minutes.
- Slip start design allows use of lower H.P. motors—cuts motor, starter and power costs.
- Cushioned starts eliminates shock, reduces maintenance costs on gears, bearings, chains or belts.
- Nothing to freeze or boil—operates from minus 60°F. to 250°F.

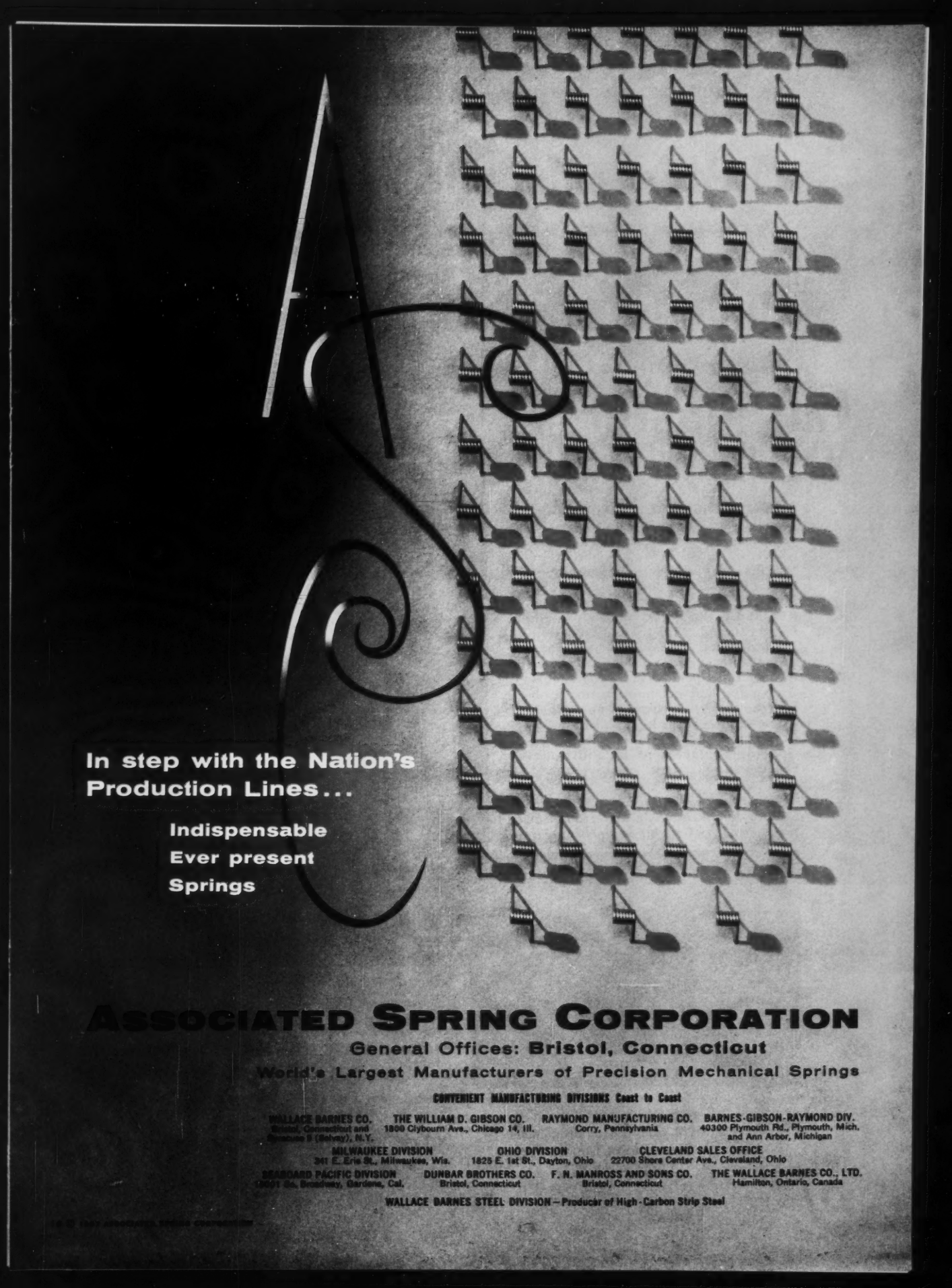


Exclusive Overload Protection!

Operating curve illustrates fixed characteristics of Whitney-Tormag Magnetic Drives which provide optimum performance and exclusive overload protection for a broad range of industrial applications.

-Whitney-TORMAG

CONSULT YOUR WHITNEY DISTRIBUTOR or write — WHITNEY CHAIN COMPANY • 249 HAMILTON STREET, HARTFORD 2, CONN.



In step with the Nation's
Production Lines...

Indispensable
Ever present
Springs

ASSOCIATED SPRING CORPORATION

General Offices: Bristol, Connecticut

World's Largest Manufacturers of Precision Mechanical Springs

CONVENIENT MANUFACTURING DIVISIONS Coast to Coast

WALLACE BARNES CO.
Bristol, Connecticut and Syracuse 5 (Solvay), N.Y.

THE WILLIAM D. GIBSON CO.
1800 Clybourn Ave., Chicago 14, Ill.

RAYMOND MANUFACTURING CO.
Corry, Pennsylvania

BARNES-GIBSON-RAYMOND DIV.
40300 Plymouth Rd., Plymouth, Mich. and Ann Arbor, Michigan

MILWAUKEE DIVISION
241 E. Erie St., Milwaukee, Wis.

OHIO DIVISION
1825 E. 1st St., Dayton, Ohio

CLEVELAND SALES OFFICE
22700 Shore Center Ave., Cleveland, Ohio

SEABOARD PACIFIC DIVISION
13031 So. Broadway, Gardena, Cal.

DUNBAR BROTHERS CO.
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F. N. MANROSS AND SONS CO.
Bristol, Connecticut

THE WALLACE BARNES CO., LTD.
Hamilton, Ontario, Canada

WALLACE BARNES STEEL DIVISION — Producer of High-Carbon Strip Steel

Reduces Machining Time

with

BULLARD

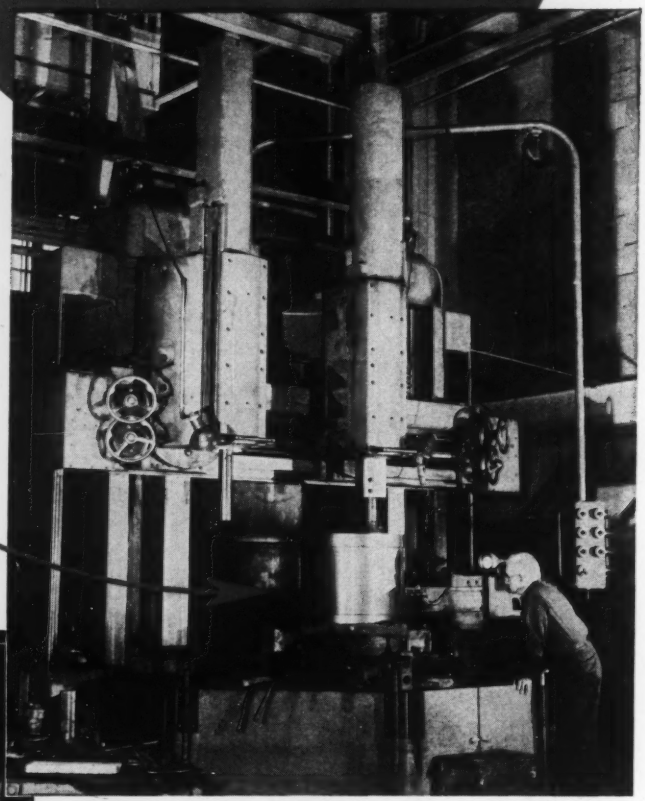
35% OVER EARLIER MODEL

Cut Master

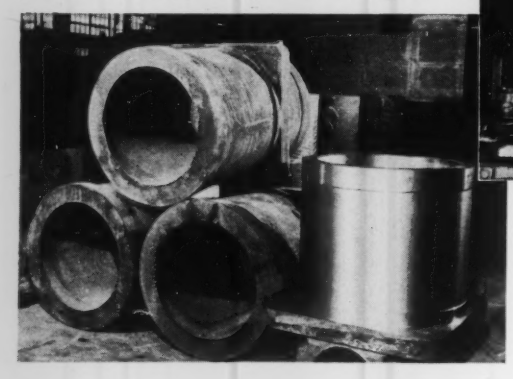
VERTICAL TURRET LATHE

MODEL 75

In the machining of a barrel housing used in a large mechanical press, manufactured by the Clearing Machine Co., Chicago, Ill., Mr. L. W. Prochnow, Factory Manager says "our 66" Cut Master, Model 75 is a big, husky machine. Its heavier rams, overall rugged construction and greater horsepower provide higher speeds and feeds easily controlled from the movable Pendant. These features enable us to cut our floor to floor time, per piece, by four hours. And we've had no maintenance problems in nearly two years of operation." These same cost savings can be applied to your machining problems when considering replacement or additional capacity in your plant.



From rough casting, weighing 1,780 lbs., 28" in diameter and 36" long, to finished piece with a 35% saving in machining time.



to cut costs
when cutting metals—
buy BULLARD

Our nearest Sales Office or Distributor will be glad to show you how or write for complete catalog to

THE BULLARD COMPANY
BRIDGEPORT 9, CONNECTICUT

Brush wire, crimped (as shown) or straight, now produced in multiple strand, and furnished in coils or straight hanks depending on wire size.

How a **new idea in wire** *cleaned up a brush production problem*

● Maybe you can profit by the kind of interest and action applied to customers' problems by the Worcester Wire Works Division of National-Standard. Take wire brush manufacture for example . . .

Until recently, brush manufacturers had to cut through a coil of wire, then gather by hand and by guesswork the approximate number of wires for the type of brush in production. Naturally this involved a lot of cut-off waste, plus the wire lost through faulty guesswork.

Now, to overcome this waste, Worcester Wire Works has developed ways to produce and furnish wire in predetermined bunches (up to 400 wires per bunch) with *exactly* the right number of wires for a given brush. Much costly loss is eliminated, more brushes are produced per pound of wire, and production is speeded.

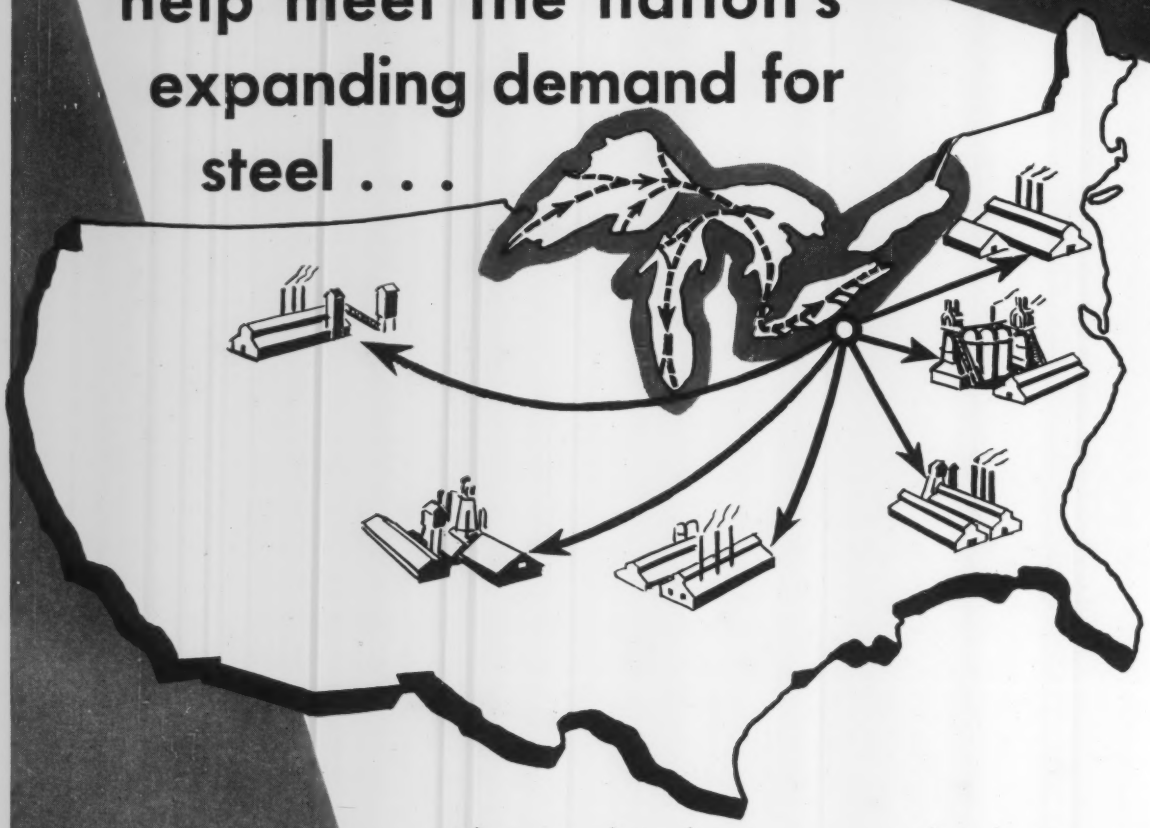
The point is, Worcester Wire Works people specialize in more than quality wire. They also specialize in the kind of service and exploration that time and again cuts costs for customers. Better check with them on your wire needs. You'll like the way they do business.

NATIONAL NS NATIONAL-STANDARD Company STEEL WIRE/WIRE **STANDARD**

DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; *tire wire, stainless, music spring and plated wires* • **WORCESTER WIRE WORKS, Worcester, Mass.;** *high and low carbon specialty wires* **WAGNER LITHO MACHINERY, Secaucus, N. J.;** *metal decorating equipment* • **ATHENIA STEEL, Clifton, N. J.;** *flat, high carbon spring steels* • **REYNOLDS WIRE, Dixon, Ill.;** *industrial wire cloth*

CLIFFS *High Grade Ores*

help meet the nation's expanding demand for steel . . .



The steel industry grows by leaps and bounds, as living standards improve and the population increases, and Cliffs high grade iron ores help the steel industry meet the expanding demand for steel.

LAKE SUPERIOR IRON ORES OF OUTSTANDING UNIFORMITY
• VESSEL TRANSPORTATION • FERRO ALLOYS • COAL

The Cleveland-Cliffs Iron Company

UNION COMMERCE BUILDING • CLEVELAND 14, OHIO

ANNOUNCING...

the Beryllium Copper ROLLPIN®

Strong . . . highly resistant to corrosion . . . nonmagnetic . . . extremely conductive

Now you can use Rollpin to cut assembly and maintenance costs in a whole new group of applications. A new line made of beryllium copper, one of the strongest of the copper base alloys, opens the door to a wide variety of uses where resistance to corrosive attack, good electrical properties and other unusual characteristics are required. These slotted tubular copper spring-pins can be used in assemblies that range from plumbing fixtures to electrical instruments, particularly in conjunction with other copper base alloy components.

Rollpin has already established its ability to replace taper pins, straight pins and set screws; to serve as a rivet, dowel, hinge pin, cotter pin or stop pin . . . eliminating special machining, tapping and the need for hole reaming or precision tolerances. Driven into a hole drilled to normal production standards, it locks securely in place, yet can be readily drifted out and reused whenever necessary.

Rollpin is available in beryllium copper from .062″-diameter to .250″-diameter, and in steel and stainless steel up to .500″-diameter.

ELASTIC STOP NUT (ESNA) **CORPORATION OF AMERICA**

Dept. R35-860, Elastic Stop Nut Corporation of America
2330 Vauxhall Road, Union, New Jersey

Please send me the following free fastening information:

☐ Data on beryllium copper Rollpin

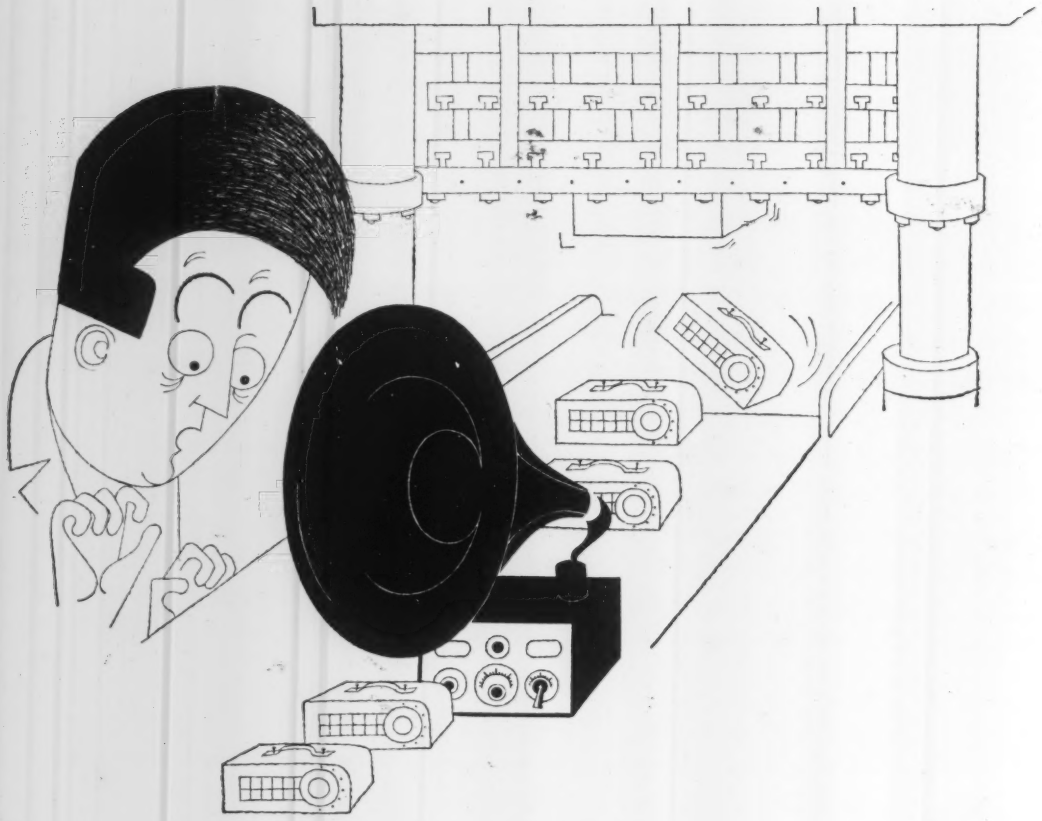
☐ Here is a drawing of our product. What self-locking fastener would you suggest?

Name_____ Title_____

Firm_____

Street_____

City_____ Zone_____ State_____



Got a plastic molding problem?

Solve it with **Crucible CSM 2 Tool Steel.** It's manufactured to mold and die steel quality. And it's promptly available from local Crucible warehouse stocks.

CSM 2 tool steel is electric melted to a high degree of uniformity in composition and structure. It has superior machining and polishing characteristics. And CSM 2 is pre-hardened—it eliminates time, cost and risks of heat treatment. Choose it for plastic molds, zinc die casting dies, and holder blocks.

Besides CSM 2 there are dozens of other special tool steels stocked at local Crucible warehouses.

And you can rely on Crucible for practical, helpful advice on selection and fabrication. For Crucible is the only specialty steel producer *fully integrated to the point of use*. That means control and responsibility from raw material to warehouse delivery to you.

STOCKS MAINTAINED OF:
Rex High Speed Steel . . . ALL grades of Tool Steel (including Die Casting Die and Plastic Mold Steel, Drill Rod, Tool Bits, and Hollow Tool Steel Bars) . . . Stainless (Sheets, Bars, Wire, Billets, Electrodes) . . . Max-el, Hy-Tuf, AISI Alloy... Onyx Spring, Hollow Drill Steel and other special purpose steels.

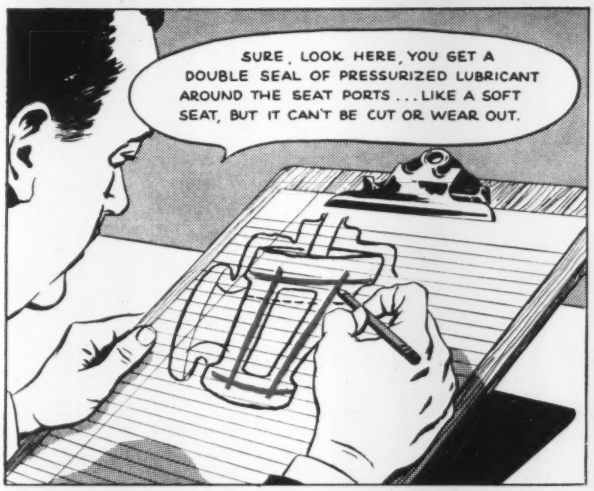
CRUCIBLE WAREHOUSE SERVICE

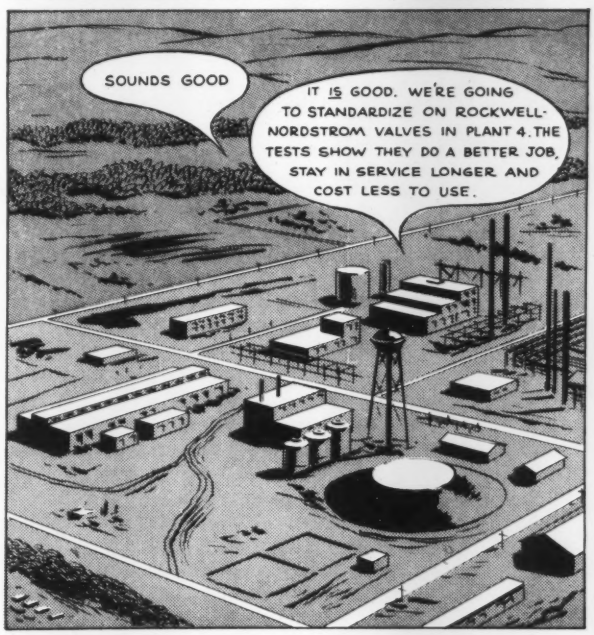
Crucible Steel Company of America

General Sales Offices, The Oliver Building, Mellon Square, Pittsburgh 22, Pa. Branch Offices and Warehouses: Atlanta • Baltimore Boston • Buffalo • Charlotte • Chicago • Cincinnati • Cleveland • Dallas • Dayton • Denver • Detroit • Grand Rapids Harrison • Houston • Indianapolis • Los Angeles • Milwaukee • New Haven • New York • Philadelphia • Pittsburgh • Portland, Ore. Providence • Rockford • San Francisco • Seattle • Springfield, Mass. • St. Louis • St. Paul • Syracuse • Toronto, Ont.

COST CUTTING IN ACTION

by Rockwell-Nordstrom





ROCKWELL-
Nordstrom
VALVES

LUBRICANT SEALED FOR POSITIVE SHUT-OFF

Rockwell-Nordstrom valves are available in a complete range of sizes and ratings in semi-steel, steel, stainless steel and other corrosion resisting metals.

Send Coupon For Free Literature

Rockwell Manufacturing Company
Rockwell-Nordstrom Valve Division
Department CS Pittsburgh 8, Pa.

☐ Please send me complete information on Rockwell-Nordstrom valves for process, industrial and manufacturing flow control.

☐ Please send me the name of your nearest distributor . . . ask him (to) (not to) call immediately.

Name_____ Title_____

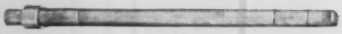
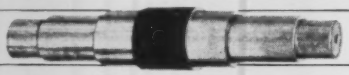
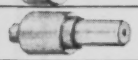
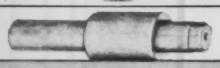
Firm_____

Street_____

City_____ Zone_____ State_____

10 JOBS ANALYZED

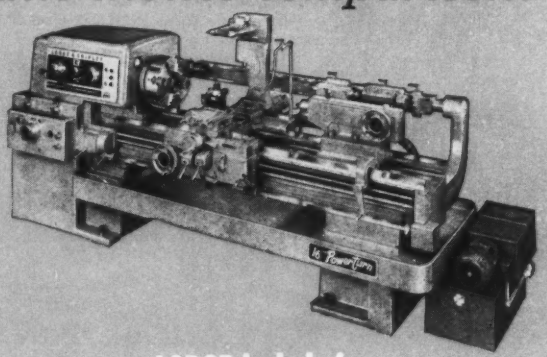
...important savings obtained on every one with new Lodge & Shipley Powerturn Copymatic lathe

Workpiece	Pieces in lot	Set-up hours	Machine hours	Total hours	Time/ part minutes	TIME SAVED	Machine used
	48	2.1	6.2	8.3	10.3		automatic lathe
	60	0.9	3.6	4.5	4.5	56%	Powerturn Copymatic
	18	1.0	1.9	2.9	9.6		automatic lathe
	20	0.6	1.1	1.7	5.1	47%	Powerturn Copymatic
	30	2.7	9.1	11.8	23.6		automatic lathe
	40	1.7	6.8	8.5	12.7	47%	Powerturn Copymatic
	40	1.9	9.6	11.5	17.2		automatic lathe
	60	2.3	12.4	14.7	14.7	14%	Powerturn Copymatic
	20	0.4	0.9	1.3	3.9		automatic lathe
	20	0.3	0.3	0.6	1.8	53%	Powerturn Copymatic
	40	2.9	6.8	9.7	14.5		automatic lathe
	60	0.7	5.3	6.0	6.0	59%	Powerturn Copymatic
	20	2.5	3.4	5.9	17.7		automatic lathe
	29	0.5	3.1	3.6	7.4	59%	Powerturn Copymatic
	40	2.8	6.7	9.5	14.2		automatic lathe
	60	1.3	6.5	7.8	7.6	46%	Powerturn Copymatic
	40	1.5	6.6	8.1	12.1		automatic lathe
	30	1.3	3.2	3.5	7.0	42%	Powerturn Copymatic
	50	2.1	6.6	8.7	10.4		automatic lathe
	50	1.6	4.6	6.2	7.4	29%	Powerturn Copymatic

...the Powerturn Copymatic invites comparison!

A well-known machine tool manufacturer kept records on Powerturn Copymatic production compared to previously used automatic lathes . . . On the ten jobs recorded, savings in time alone range up to 59%! Average time savings were better than 45%! Note that set-up time (lower in every case) was included.

Virtually every Lodge & Shipley Copymatic installation has resulted in significant savings. Your Lodge & Shipley distributor will gladly help you investigate Powerturn Copymatic possibilities in your plant or write direct for additional case history data. **The Lodge & Shipley Co., 3055 Colerain Ave., Cincinnati 25, Ohio.**



your LODGE-ical choice...

Lodge & Shipley

The RIGHT combination....

B&L Strain-Tempered Steels used for the long slender tines of loading fork for high strength and toughness.

HIGH PHYSICAL PROPERTIES

Strain-Tempered Steels provide the right combination . . . "tailored" to your order.

GOOD MACHINABILITY

Strain-Tempered Bars give better machining qualities than normally obtained from steels of similar strength and physical properties.

SUITABLE DUCTILITY

Strain-Tempered Steel offers you a good balance of ductility in combination with high strength, toughness or other desired physicals.

MINIMUM DISTORTION

Strain-Tempered Bars . . . controlled in processing to develop maximum freedom from cold-working strain . . . show minimum warpage in machining, and save you costly straightening operations.

BLISS & LAUGHLIN *Strain*-TEMPERED* BAR STEELS

. . . are pre-conditioned for the job by closely controlled furnace treatments that provide the *right combination* of physical properties to meet your requirements.

You will find that these "tailored-to-order" Strain-Tempered Bar Steels are easier to fabricate . . . eliminate heat treating . . . suitable for precision parts and high strength applications.

Strain-Tempered Steels are the right combination for economical production.

Write for Bulletin No. 55 on Strain-Tempered Bar Steels

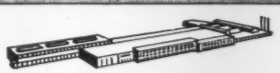
*Trade-Mark Reg.

BLISS & LAUGHLIN, INC.

GENERAL OFFICES: HARVEY, ILLINOIS

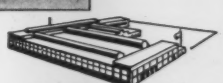
SALES OFFICES IN ALL PRINCIPAL CITIES

FOUR PLANTS:—



HARVEY, ILL.

DETROIT, MICH.

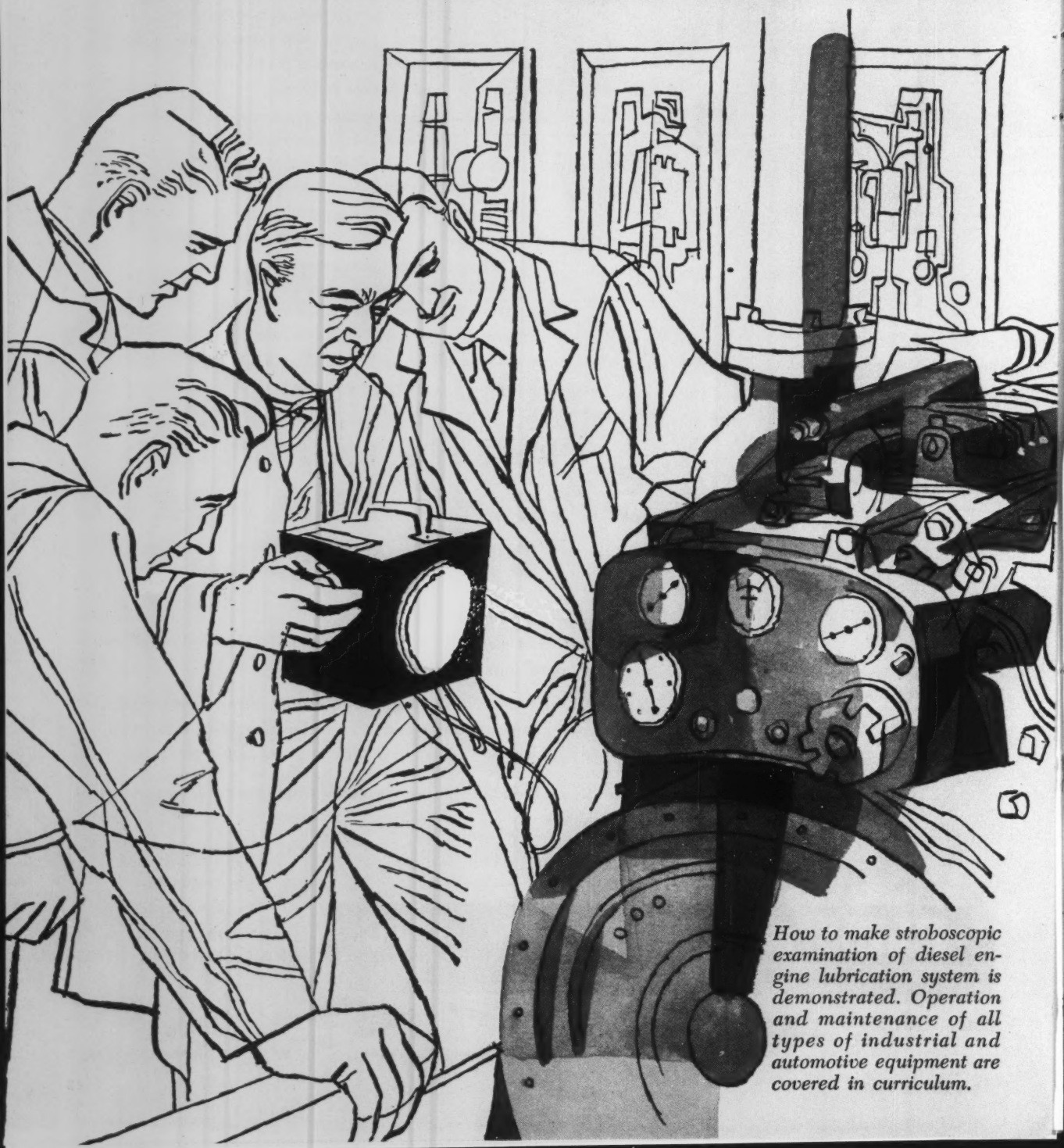


BUFFALO, N. Y.

MANSFIELD, MASS.

How does an oil company prepare men for industrial technical service work?

Here's how Standard Oil



How to make stroboscopic examination of diesel engine lubrication system is demonstrated. Operation and maintenance of all types of industrial and automotive equipment are covered in curriculum.

Lectures, shop and lab work comprise training course.

trains its men

At the Standard Oil training center on Chicago's south side—not far from the Company's refinery and research laboratory at Whiting, Indiana—men who have demonstrated an aptitude for such work are given a 17 week course in industrial lubrication, equipment maintenance and metal working. And thus begins the training Standard Oil gives its men who are to provide technical service to customers.

Most men selected for this Sales Engineering School have college degrees in some engineering or scientific field. And in most cases these men, prior to attending the school, have had field experience in technical service work to start them off with an appreciation of the problems industry meets in lubricating equipment and working with metal.

This course for lubrication specialists and engineers includes lectures and work in chemical laboratory, engine laboratory and machine shop. Senior Standard Oil men, recognized authorities on lubrication and metal working, are the instructors. Other Standard Oilers with teaching skills and years of field experience, direct the shop work and supervise the school's laboratories.

Class, shop and lab work are augmented by field trips to plants where "students" learn first-hand more about the lubrication problems confronting industrial customers.

The Standard Oil Sales Engineering School has graduated 15 of these classes. The many men who have completed the course are now serving customers out of Standard's 23 offices in fifteen Midwest and Rocky Mountain states. Would you like one of these men to call on you? Then telephone your nearby Standard Oil office. Or write Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Ill.

STANDARD

STANDARD OIL COMPANY
(Indiana)

Testing and comparing bearing lubrication methods.

Kinematic viscosimeter is used to test viscosity of lube oil. C. S. Brown (right) learns to run test. Brown, like many classmates, has science degree.

WASHBURN WIRE COMPANY, NEW YORK CITY

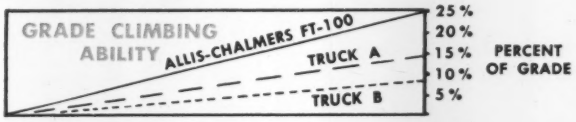
WASHBURN

CLEAN, UNIFORM BILLETS – STRIP – RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

Here's a 10,000-lb lift truck that's Right for the job!

THE NEW ALLIS-CHALMERS MODEL FT-100 with EXTRA POWER PERFORMANCE RUGGEDNESS

Heavy-duty industrial engine is built *by* Allis-Chalmers specifically *for* lift truck service. This large (230-cu in. displacement) engine provides high torque at normal engine speeds, *gives the truck power enough to carry a full load up a 25-percent grade.* User records show Allis-Chalmers industrial engines not only outperform others, but operate many hours longer before overhaul. Available in diesel, gasoline or LP gas.



Workingest truck in its class. The FT-100 has the extra weight, traction and operator controls for superior performance. Its added weight is well placed to provide stability for heavy loads and high lifts. Excellent traction means extra usefulness, ability to work under adverse conditions. Controls are simple and positioned much like those in a car for easy handling. This new truck has standard ITA "shaft-type" fork mounting which permits using a wide range of attachments.

Outside turning radius: 100 in.
Over-all height: 83 in.; stacking height: 110 in. with standard mast
Width: 52 in.; length (less forks): 107½ in.

Power steering and power shift transmission are available as extra equipment.

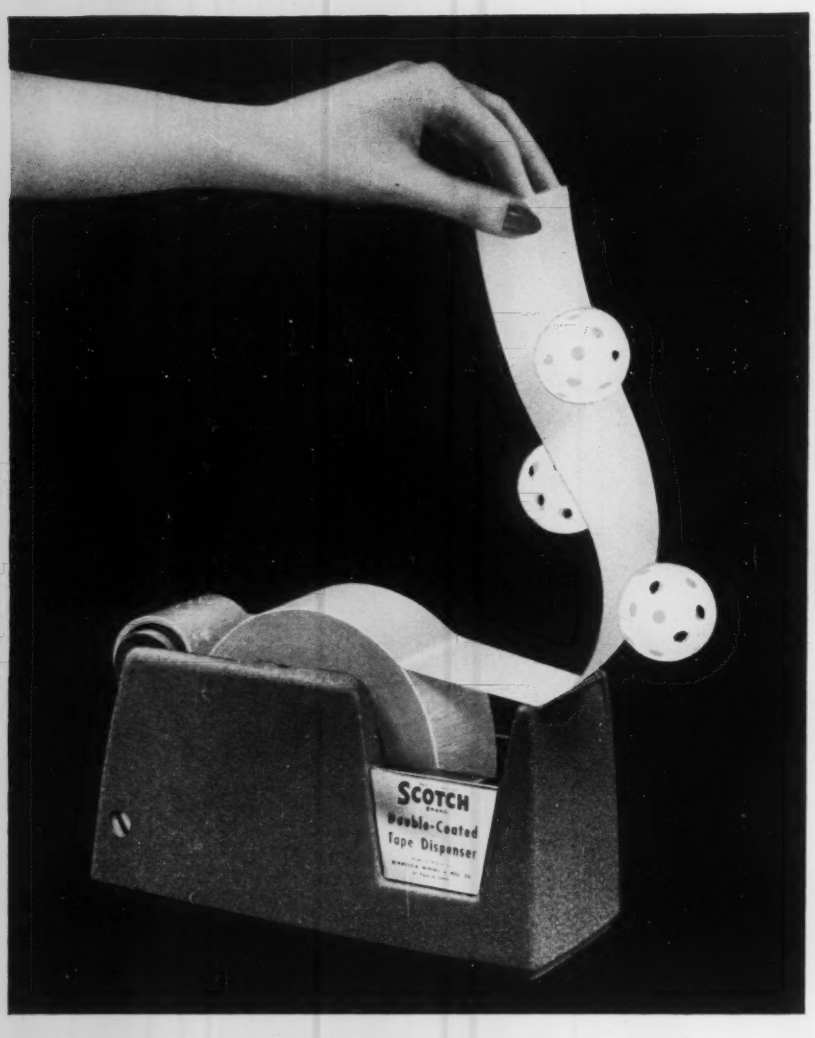
Rugged industrial-type frame. Welded construction assures complete alignment of parts for reduced maintenance and longer truck life. New roller-mounted "extra lift" mast provides up to 19 percent higher lift without increasing the over-all lowered height.

The FT-100 has quality construction and functional design that includes unusual accessibility for service and maintenance. Let your Allis-Chalmers material handling dealer tell you more about this 10,000-lb lift truck that's *right for the job*. Send for Bulletin BU-334A.

ALLIS-CHALMERS, MATERIAL HANDLING DEPT., BUDA DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

BH-53



Tape that sticks on both sides

Just whisk off the protective liner from "SCOTCH" Brand Double-Coated Tape to expose a *second* adhesive surface. With *two* sides of the strongest adhesive on any double-coated pressure-sensitive tape, you're all set for just about any bonding, laminating, or splicing job. Ask your "SCOTCH" Brand Tape distributor for a free demonstration, or write us for complete information.

Always specify "SCOTCH" Brand, the *quality* tape... and *stick* with it!

DOUBLE-COATED... *one of over 300 Pressure-Sensitive Tapes, trademarked*...

REG. U. S. PAT. OFF.

SCOTCH BRAND

WORLD'S LARGEST MAKER OF PRESSURE-SENSITIVE TAPES

7800 TIMES AROUND THE WORLD...

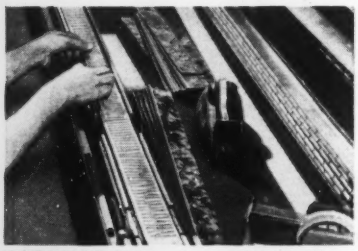
1957 TWO BILLIONTH ROLL YEAR 1957

The term "SCOTCH" is a registered trademark of Minnesota Mining and Manufacturing Company, St. Paul 6, Minn. Export Sales Office: 99 Park Avenue, New York 16, N.Y. In Canada: P.O. Box 757, London, Ontario.

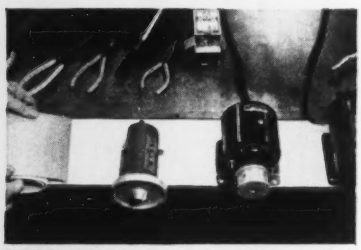
© 3M Co., 1957

PRODUCT OF 3M COMPANY RESEARCH

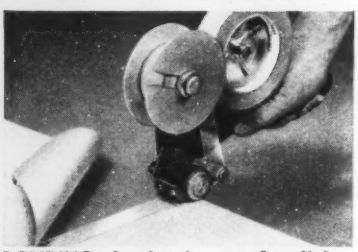
Look what you can do with it!



AUTOMATION on the production line: "SCOTCH" Brand Double-Coated Tape secures electrical coils to base plate through subsequent riveting, soldering and assembly.



PRODUCTION can often be speeded with "SCOTCH" Double-Coated Tapes. Above: motors and generators held in place on test bench with double-coated tape. Tape eliminates bolting and unbolting of units.



BONDING, laminating, and splicing operations can often be speeded and simplified with "SCOTCH" Brand Dispenser H-125. Dispenser strips protective liner from tape; rolls it neatly; has built-in cutter.

FREE FOLDER shows many additional ways "SCOTCH" Brand Double-Coated Tapes can save time and money and solve production problems for you. Write on your letterhead to 3M Co., Dept. GK-87.

Largest bronze centrifugal casting ever made, 54¾" O.D. x 49½" I.D. x 346½" long. Charge weight—72,300 pounds.

At Sandusky,

GIANTS ARE ROUTINE...

Small wonder. We serve giant industries . . . paper-making, shipbuilding, metalworking, atomic energy, petro-chemical, and others . . . with centrifugally cast cylinders and tubular parts, many of which can't be made by any other process to the exacting standards required.

It's the 47 years of specialized experience coupled with unequalled manufacturing facilities . . . that makes it routine for our engineers and production teams to cast and machine *cylinders from 7" to 54" O.D. and up to 33 feet in length* . . . in a wide range of alloys meeting special performance requirements.

Do you need a giant cylindrical form . . . or a small one . . . machined to exact working dimensions? Send us your specifications; we'll reply promptly.

Sandusky Centrifugal Castings offer you 4 important advantages:

1. ***SUPERIOR MECHANICAL PROPERTIES*** —to meet exacting design requirements
2. ***UNIFORM SOUNDNESS***—free from harmful inclusions and porosity
3. ***HIGHEST QUALITY***—to insure long, dependable, trouble-free service
4. ***JOB-READY CASTINGS***—machined to your exact specifications, eliminate extra costs from rejects, down-time, loss of production

CENTRIFUGAL CASTINGS

Sandusky Foundry & Machine Company

SANDUSKY, OHIO • *Stainless, Carbon, Low Alloy Steels—Full Range Copper-Base, Nickel-Base Alloys*

NEW: *Man-made Giraffe*

Unique Aerial Platform Moves On Cylinders Made From Pittsburgh Tubes

Giraffes are big business at Pitman Manufacturing Company.

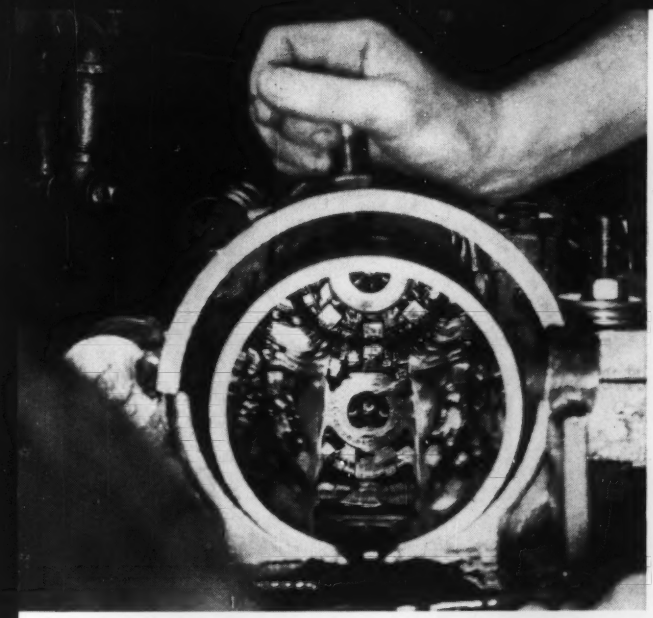
Not the giraffes of the animal kingdom but ingenious hydraulic aerial platforms. These mechanical "Giraffes" are used for anything from de-icing a giant Air Force bomber to fighting fires in tall buildings.

Pitman's truck-mounted Giraffes depend on hydraulic cylinders made exclusively of Pittsburgh Steel Company's seamless mechanical tubes. Giraffes are finding wide acceptance in varied industries because:

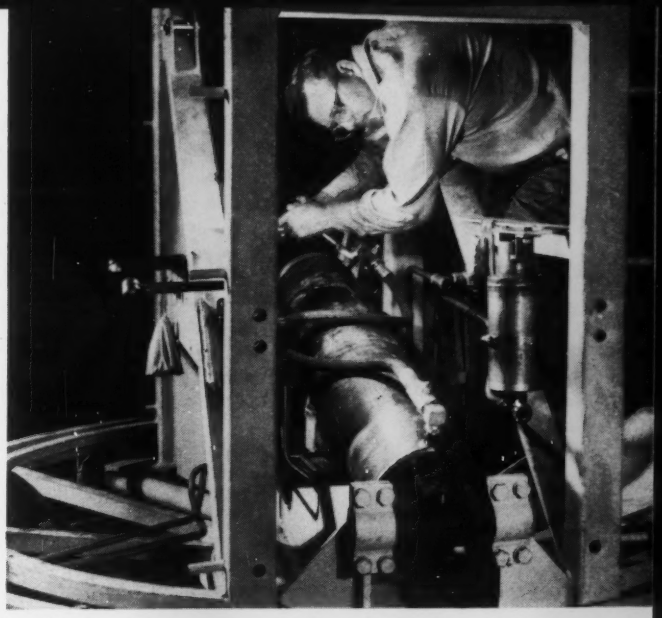
- Workmen can reach heights up to 65 feet in a fraction of the time and cost required by other methods. And their tools go up right with them.
- The roomy, insulated platform carries two men who can control all platform movements with controls duplicating those on the ground.
- The aerial platform can rotate a full 360 degrees in either direction in a radius as great as 35 feet.
- The largest of three models permits the 31-foot upper boom to move in a 160-degree vertical arc. The 23-foot lower boom can move in an 80-degree arc, so workmen can reach the exact spot they want.
- Hydraulic outriggers, operated independently, are raised or lowered by moving hand levers at side of truck.

Since hydraulic cylinders are vital to safe, dependable, economic operation of the Giraffe, Pitman makes its own cylinders with great care.

(Advertisement)



Horizontal honing of Pittsburgh Steel tubes is an exacting process. Inside the tube, you can see part of the hones. At the end of the tube, the hones are mirrored on polished steel.



Finished cylinder is installed on turntable of Pitman Giraffe. This cylinder supports and moves the lower boom. Completed Giraffe will be mounted on truck supplied by customer.

All Giraffe hydraulic cylinders are made from tubing produced by the Tube Mills of Pittsburgh Steel Company and sold by the Kansas City distributor, Metal Goods Corporation.

"We get high production from tubes because Pittsburgh tubes hold to close tolerances," declared Arthur Moore, vice president and general manager of Pitman Manufacturing. He added:

"We give Pittsburgh Steel tubes credit for cutting our scrap losses. But economy isn't all we're thinking of. Since we never forget that men's lives depend on our cylinders we build a safety factor of at least three into every cylinder. We've never had a burst cylinder or a cylinder wall failure with Pittsburgh tubes.

"Finally, Pittsburgh Steel gives us the kind of service we like."

Mr. Moore said engineers from Pittsburgh Steel helped analyze the company's tube problems, suggested some design changes and took Pitman's prints back to the mill to make tubing which exactly fills the bill.

"The service which Pittsburgh Steel instituted ended our tubing problems," said Mr. Moore. "Our cylinders have been very satisfactory ever since."

Whether you make hydraulic cylinders or use seamless mechanical tubing in another application needing uniformity, close tolerances and engineering help, you can profit by Pitman's experience.

Start today by getting in touch with trained help available through any Pittsburgh Steel Company District Office or from one of the Pittsburgh Steel distributors listed at right.

Fire-fighting is just one of many uses for the Pitman Giraffe. These firefighters can move their platform to any given spot quickly and easily without losing time when time counts most.

Pittsburgh Seamless Distributors

Baker Steel & Tube Company
Los Angeles, California

Chicago Tube & Iron Company
Chicago, Illinois

Cleveland Tool & Supply Co.
Cleveland, Ohio

Drummond McCall & Co., Ltd.
Montreal, Quebec, Canada

Edgcomb Steel Company
Philadelphia, Pennsylvania

Gilmore Steel & Supply Co.
San Francisco, California

Earle M. Jorgensen Co.

Perry Kilsby, Inc.
Los Angeles, California

Mapes & Sprowl Steel Co.
Union, New Jersey

Metal Goods Corporation
St. Louis, Missouri

Miller Steel Company, Inc.
Hillside, New Jersey

A. B. Murray Co., Inc.
Elizabeth, New Jersey

Ryerson, Joseph T. & Son, Inc.
Chicago, Illinois

Solar Steel Corporation
Cleveland, Ohio

Steel Sales Corporation
Chicago, Illinois

Tubular Sales
Detroit, Michigan

Ward Steel Service Company
Dayton, Ohio

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

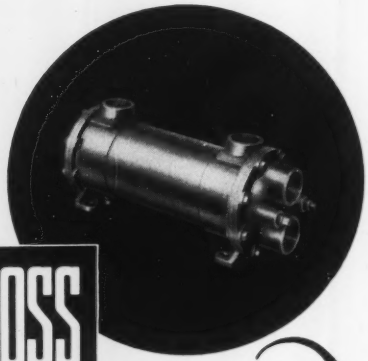
District Sales Offices

Atlanta, Chicago, Cleveland, Dallas, Dayton, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Tulsa, Warren, Ohio

(Advertisement)

With a Ross Exchanger on the job...

Bliss Hydro-Dynamic Press keeps cool under pressure



Performing hot gabbaging and piercing operations in the manufacture of 105 mm projectiles, this 500 ton Bliss Hydro-Dynamic Press functions with accurate and consistent hydraulic pressures.

Rated power is insured by a factory installed Ross Exchanger, furnished to hold hydraulic temperatures in check *at all times*. Pump slippage from over-heated, thinned oil is effectively prevented, thereby assuring uniform pressures of known intensity.

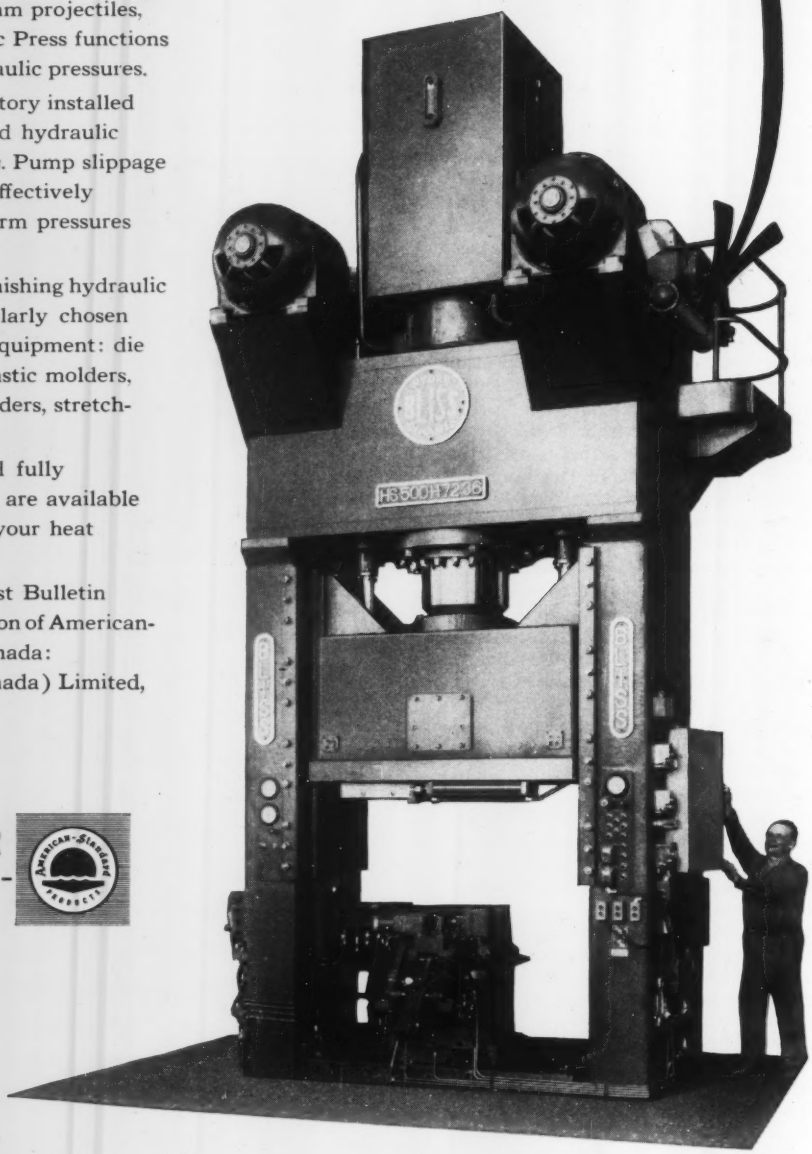
Ruggedly built to withstand punishing hydraulic shock, Ross Exchangers are regularly chosen for numerous types of hydraulic equipment: die casters, metal drawing presses, plastic molders, extrusion presses, fluid drives, welders, stretch-wrap formers, and many others.

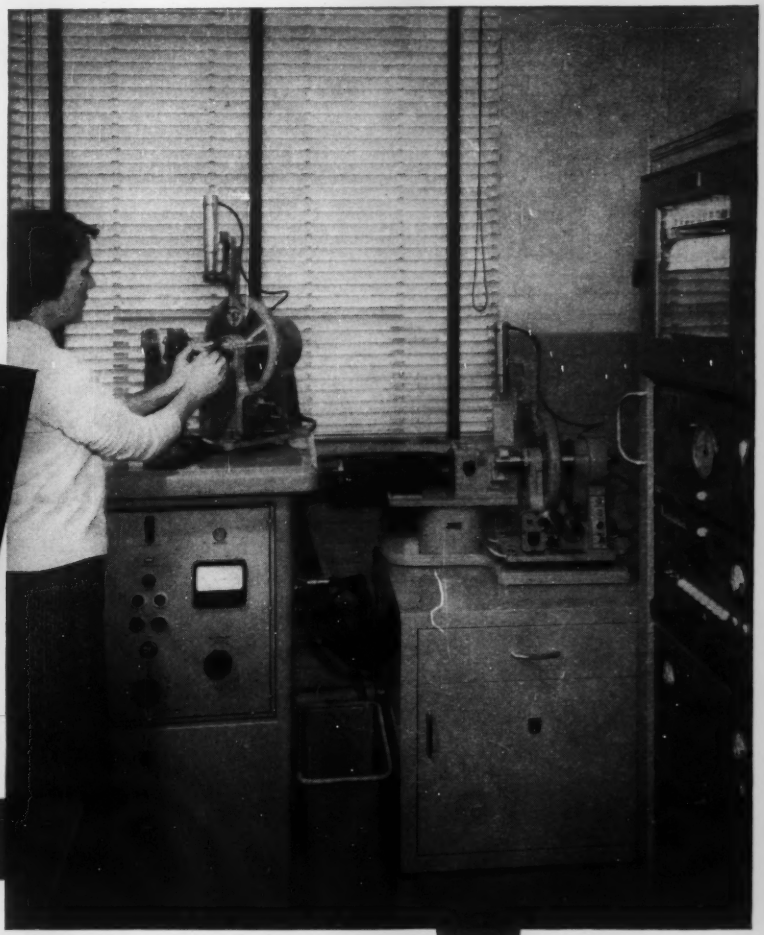
Completely pre-engineered and fully standardized, these compact units are available in a wide range of sizes to meet your heat transfer requirements.

For detailed information request Bulletin 1.1K5. Ross Heat Exchanger Division of American-Standard, Buffalo 5, N. Y. In Canada: American-Standard Products (Canada) Limited, Toronto 5, Ont.

ROSS HEAT EXCHANGER

Division of AMERICAN - Standard





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SOCKET SCREWS
THE H-K WAY—

X-RAY UNITS PERFORM A COMPLETE AND ACCURATE METAL ANALYSIS

We know it's safe to guarantee unfailing performance for all H-K products!

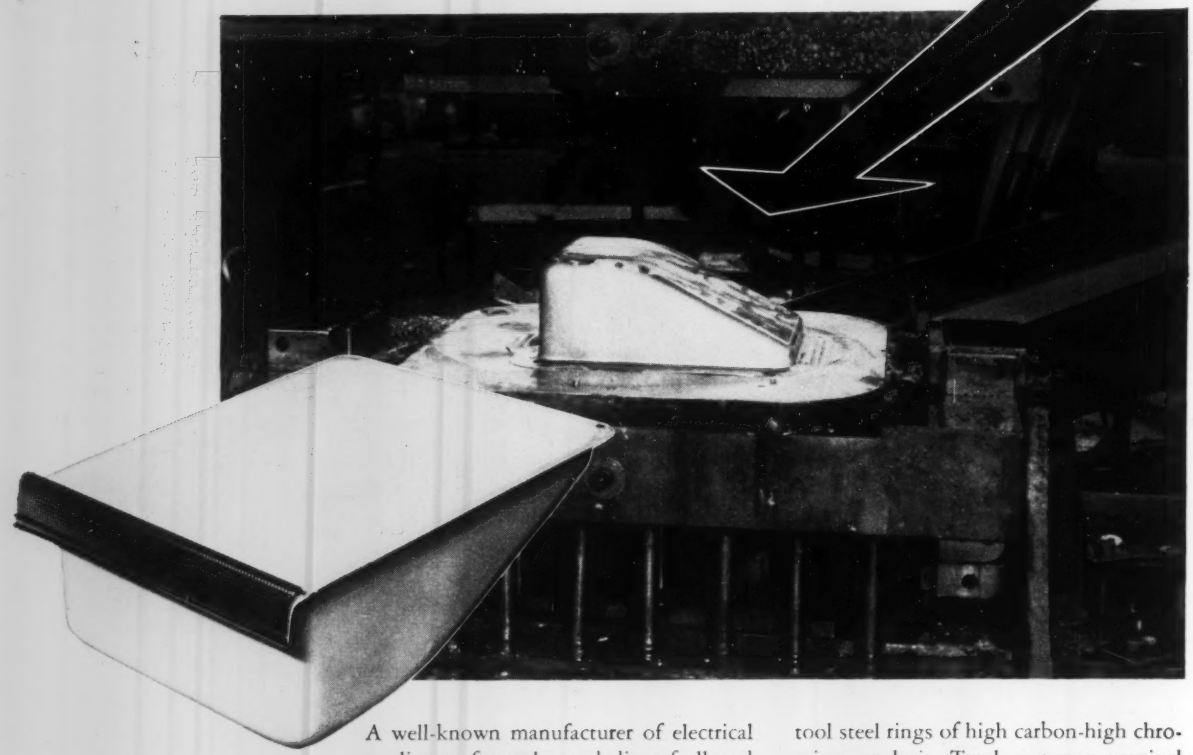
For the finest in socket screw products . . . for unmatched SAME-DAY SERVICE—the name to remember is Holo-Krome Write for free catalog and technical information.

Sold Only Through Authorized Holo-Krome Distributors

HOLO-KROME SOCKET SCREWS

THE HOLO-KROME SCREW CORPORATION • HARTFORD 10, CONN.

Here's how A-L CAST-TO-SHAPE TOOL STEELS solved a serious scrap problem on this job



A well-known manufacturer of electrical appliances formerly used dies of alloyed ductile iron castings to draw refrigerator crisper pans.

These dies had to be redressed after every 10,000 pieces (approximate cost: $1300 each) and had to be replaced after every 30,000 pieces. 8 to 10% of the pans were scrapped due to defects.

Because of this scrap problem and the severity of the draw—a 52% reduction of the steel—it was decided to rebuild the dies using a suitable grade of tool steel.

A 2″ cut was taken off the top of the old cavity and the draw ring. These cuts were replaced with A-L Cast-to-Shape tool steel rings of high carbon-high chromium analysis. Total cost was nominal compared with buying entirely new dies.

Each of the revised dies has produced approximately 500,000 pans. Their condition indicates that probably *twice* that many can be drawn before the dies must be redressed. Defective pieces have been reduced to a mere 1½ to 2%—*an 80% reduction!*

● Ask your A-L representative TODAY how Cast-to-Shape tool steel can help solve your production problems . . . or write ***Allegheny Ludlum Steel Corporation, Forging and Casting Division, Detroit 20, Mich.***

SEND FOR THIS NEW CATALOG

"FORGING AND CASTING PRODUCTS"

Contains the latest information on FCC Air Hardening, Oil Hardening and other Cast-to-Shape Tool Steel Specialties that can save you time and money . . . also Composite Die Sections and Smooth Hammered Forgings in a wide range of tool and stainless steels. *Get your copy NOW*

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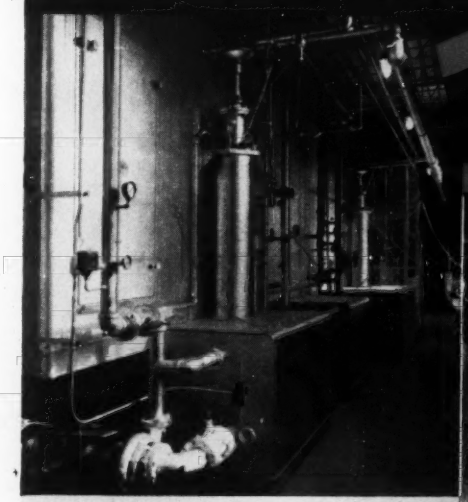
Allegheny Ludlum

WSW 6123

AL® FINE TOOL STEELS SINCE 1854

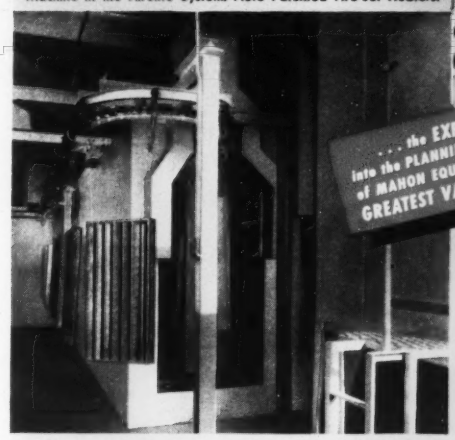
COMPLETE *Finishing* SYSTEMS

. . . for ENAMELS • LACQUER • PAINT • VARNISH

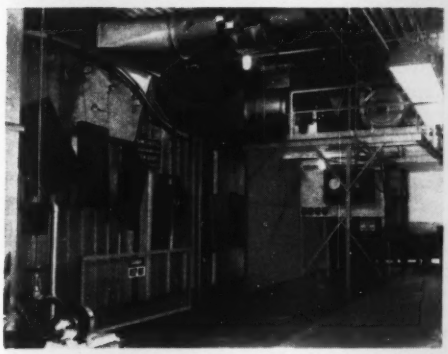


Partial View of Mahon Five-Stage Metal Cleaning and Bonderizing Machine in the Airolite System. Note Patented Fire-Jet Heaters.

General View showing the Loading and Unloading Station in the Complete, Conveyorized Mahon Finishing System recently installed in the Airolite Company's Plant, Marietta, Ohio.



Exit Opening in the Mahon Dry-Off Oven. This Oven is Combined with the Paint Baking Oven and Built as One Direct Gas-Fired Unit.



In the view above you see an Oven Heating Unit and a Control Cabinet which Houses Temperature Recorder and Safety Devices. Ventilated Solvent Vapor Chamber appears at left.

High Quality, Durable Finish on AIROLITE LOUVERS is Produced in a COMPLETE, MODERN MAHON SYSTEM!

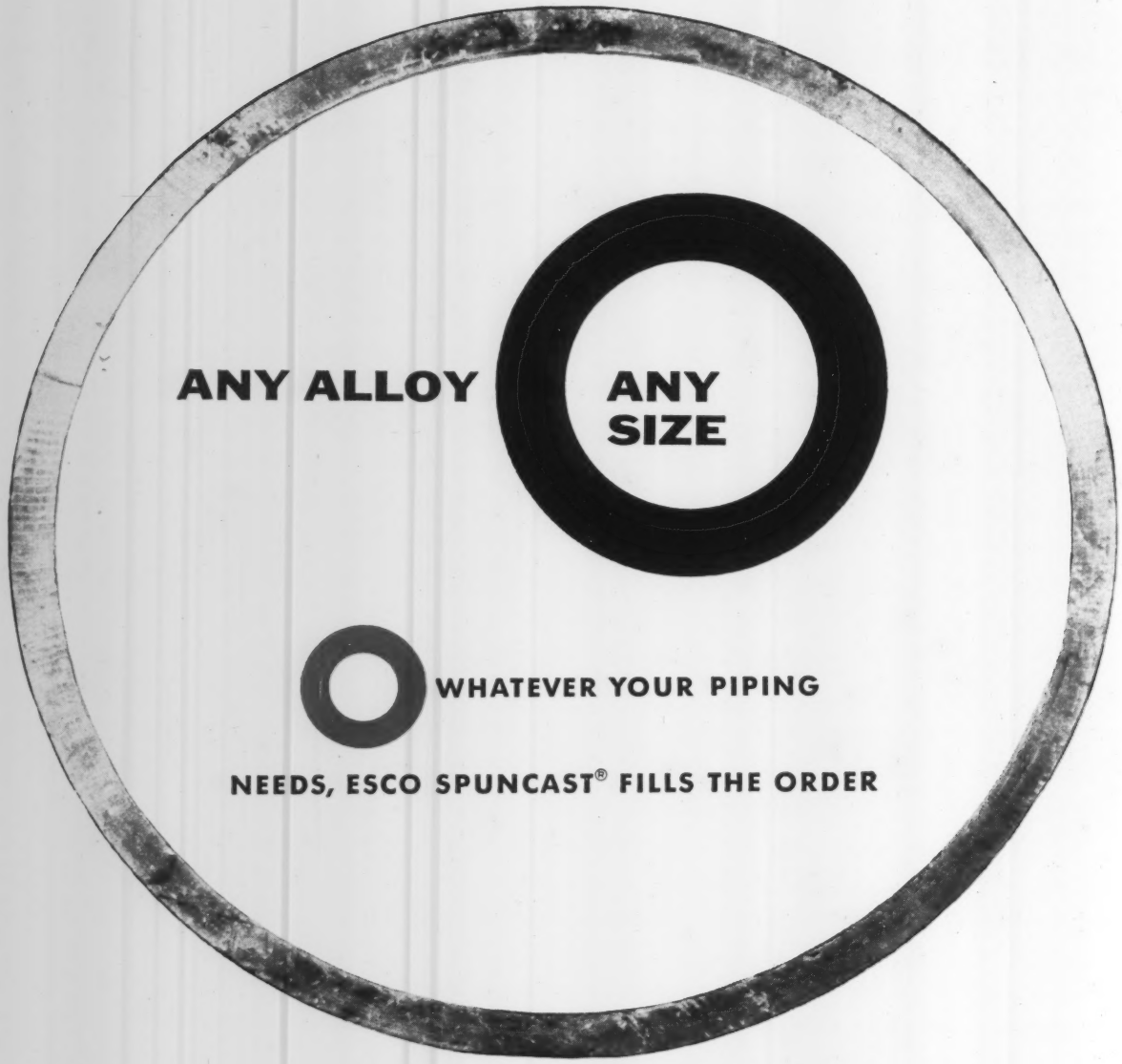
The Airolite Company, Marietta, Ohio, manufacturers of high quality fixed and adjustable Louvers of all types, and numerous other metal products, have recently modernized production facilities which now include a complete, new Mahon Finishing System specially designed to accommodate all products presently in production as well as several items planned for the future. The new Mahon Finishing System in the Airolite plant includes a five-stage Metal Cleaning and Bonderizing Machine, Dry-Off Oven, Flow Coating Machine with a Ventilated Solvent Vapor Chamber, and a Paint Baking Oven . . . processing is continuous and automatic from conveyor loading to unloading. This is one of thousands of Mahon finishing systems that have been specially designed and installed in each case to meet the specific requirements of the manufacturer. If you have a finishing problem, or are contemplating new finishing equipment, you, too, will want to discuss methods, equipment requirements and possible production layouts with Mahon engineers . . . you'll find them better qualified to advise you, and better qualified to do the all-important planning, engineering and coordinating of equipment to produce the finest finish at minimum cost. See Sweet's Plant Engineering File for information, or write for Catalog A-657.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

SALES-ENGINEERING OFFICES in DETROIT, NEW YORK and CHICAGO

Engineers and Manufacturers of Complete Finishing Systems — including Metal Cleaning, Pickling and Rust Proofing Equipment, Hydro-Filter Spray Booths, Dip and Flow Coaters, Filtered Air Supply Systems, Drying and Baking Ovens, Cooling Tunnels, Heat Treating and Quenching Equipment for Aluminum and Magnesium, and other Units of Special Production Equipment.

MAHON



Corrosion, heat, abrasion or vibration, you can reduce them all with *ESCO* Spuncast pipe. Centrifugally cast in a wide variety of *ESCO* alloy steels, heat treated and tested, *ESCO* Spuncast pipe will cut replacement costs in chemical, pulp and paper and petro-chemical plants, or in any other type of installation subject to severe conditions.

Available in special alloys, in sizes to 36″ OD and wall thickness from ¼″ up and in large or small quantities *ESCO* Spuncast Pipe is the greatest corrosion-resistant value your pipe dollars can buy.

Write for free booklet—"How to Cut Costs With *ESCO* Spuncast"

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MFG. PLANTS AT PORTLAND, ORE. AND DANVILLE, ILL.

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IN CANADA ESCO LIMITED

Garlock "makes the grade" with Galion... for over 30 years

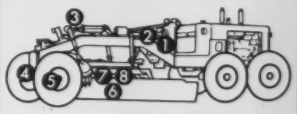
Now celebrating their 50th Anniversary, the Galion Iron Works and Mfg. Co., of Galion, Ohio is a leader in its field, and Galion Road Rollers and Motor Graders enjoy a reputation for long life and easy operation. For 30 years Garlock CHEVRON* Packings have been selected for the hydraulic cylinders of both Galion Road Rollers and Motor Graders. In fact, all eight models of the Motor Grader use CHEVRON Packings exclusively on hydraulic cylinders operating the blade, leaning front wheel, booster steering and various attachments.

The distinctive and exclusive CHEVRON design is extremely sensitive to pressure changes and ideally suited to use in shallow stuffing boxes. As pressures increase the CHEVRON Packing Rings automatically tighten to prevent leakage. As pressures decline the CHEVRON Rings instantly ease off permitting free operation without leakage. That's why cylinders using CHEVRON Packings require minimum attention and maintenance.

Exclusive CHEVRON is one more part of "the famous Garlock 2,000"... two thousand different styles of packings, gaskets, and seals for every need—the only complete line. It's one reason why your Garlock representative can provide you with unbiased recommendation. Call him today or write for CHEVRON Folder AD-115.

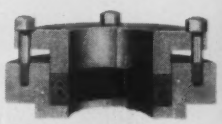
THE GARLOCK PACKING COMPANY, Palmyra, N.Y.

For Prompt Service, contact one of our 30 sales offices and warehouses throughout the U.S. and Canada.



Garlock CHEVRON Packing Rings used in 8 hydraulic cylinders on Galion Motor Graders:

1. Left Blade Lift Cylinder
2. Right Blade Lift Cylinder
3. Scarifier Cylinder
4. Leaning Wheel Cylinder
5. Booster Steering Cylinder
6. Moldboard Shift Cylinder
7. Tilt Moldboard Cylinder Right
8. Tilt Moldboard Cylinder Left

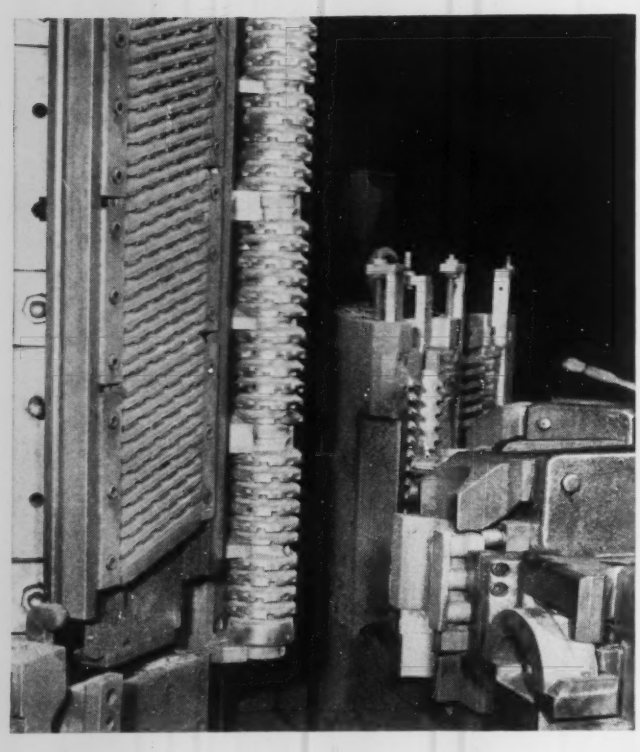


This design is entirely different from ordinary V-type packing. CHEVRON has an exclusive construction which assures the automatic action for which it is designed. Also permits the use of less packing in shallower stuffing boxes.

GARLOCK

Packings, Gaskets, Oil Seals, Mechanical Seals, Rubber Expansion Joints, Fluorocarbon Products

*Registered Trademark.



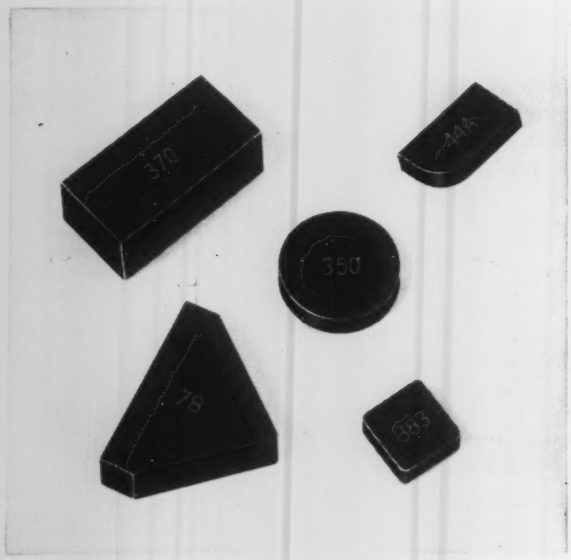
Grade 883 increases broach life 2500%

Highly abrasive cast iron used for this bearing cap at Studebaker caused conventional broaches to fail after maximum run of only 3,600 parts. After the switch to Grade 883, initial broach ran 50 days, produced 90,000 parts without service. Over-all machining costs were reduced 22%.

Grade 370 saves 155 hours' machining time

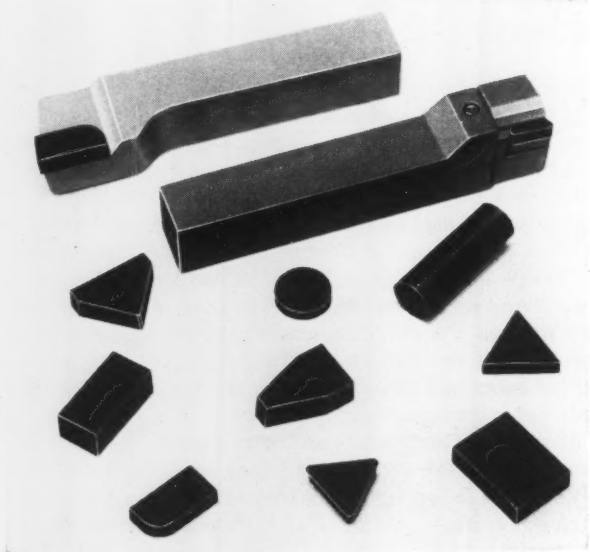
Normal machining time on this 165-ton cast-steel propeller runner at S. Morgan Smith Co. was 220 hours. Despite abrasive patches, and interrupted cuts, Grade 370 cut machining time to 65 hours – ⅓ the time. At 154 fpm, Grade 370 ran 30 hours without changing – compared to 6-8 hours with previous tools.

WHY MACHINE OUTPUT GOES UP, WITH CARBOLOY® CARBIDES ON



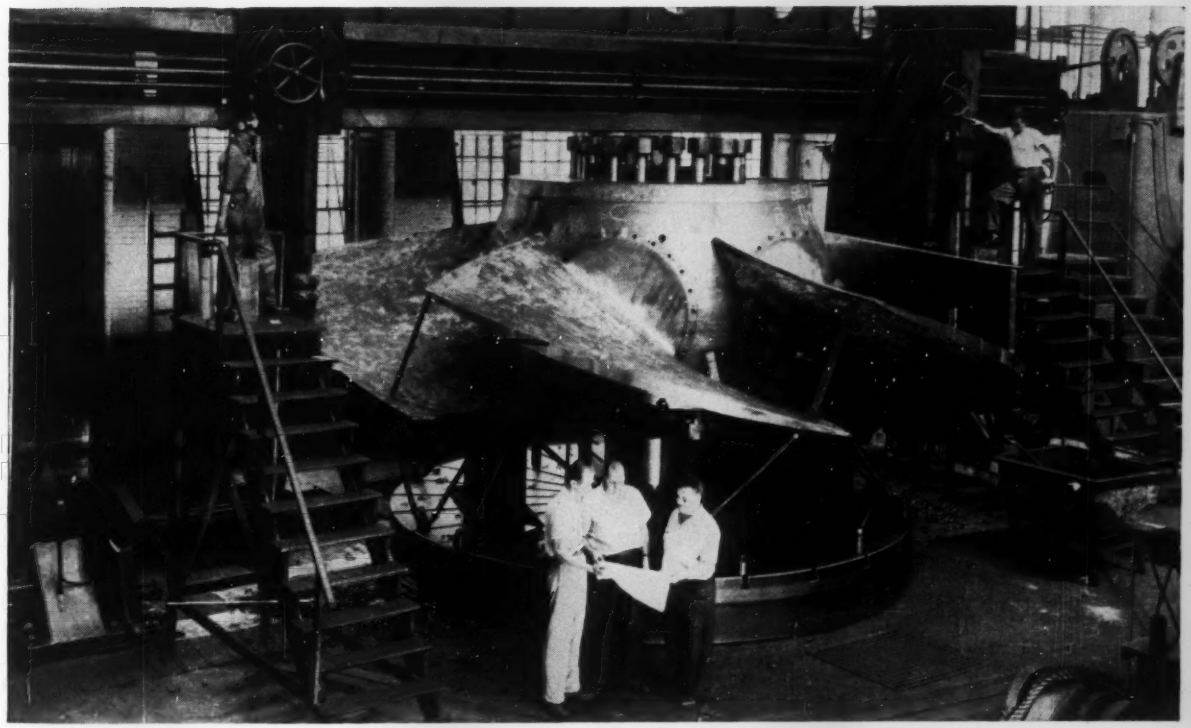
Grades for cutting every material

Eleven grades to choose from: 300 Series and 78 Series carbides for cutting steel; new Grade 860 for cast iron; five grades for nonferrous machining.



. . . in a form for handling every job

Standard tools in thirteen styles, hundreds of sizes; standard blanks in wide range of styles and sizes. Inserts for Carboloy toolholders or other standard types.



AND UNIT COST COMES DOWN, YOUR METALCUTTING JOBS

- Carboloy cemented carbides are tailored to the job
- Let you cut faster without sacrificing tool life

You'll increase the productivity of your machines, while you reduce total manufacturing cost per piece, when Carboloy cemented carbides go to work on your jobs.

Your machines will be more productive, because they can operate at greater speeds and feeds when tooled with the Carboloy grade designed for the job. And they'll produce more per shift, because Carboloy carbides take rugged machining conditions without sacrifice of tool life.

Your units costs will go down, because the use of these grades means less machining time per piece . . . with lower downtime expense, reduced grinding and maintenance charges.

Proved in the field

Hundreds of inplant case histories like the two shown above prove Carboloy cemented carbides can double and triple output, save thousands of dollars per year in machine time, manpower, and tool costs.

The reason is simple. Each Carboloy carbide grade has cutting characteristics tailored to a particular type of job. Whether you're machining ferrous or nonferrous metals, whether you're taking heavy or finishing cuts . . . one of the eleven Carboloy carbide grades handles the job. And you can quickly get the *grade* you need, in the *form* you need it.

Stocked locally by Carboloy Distributors

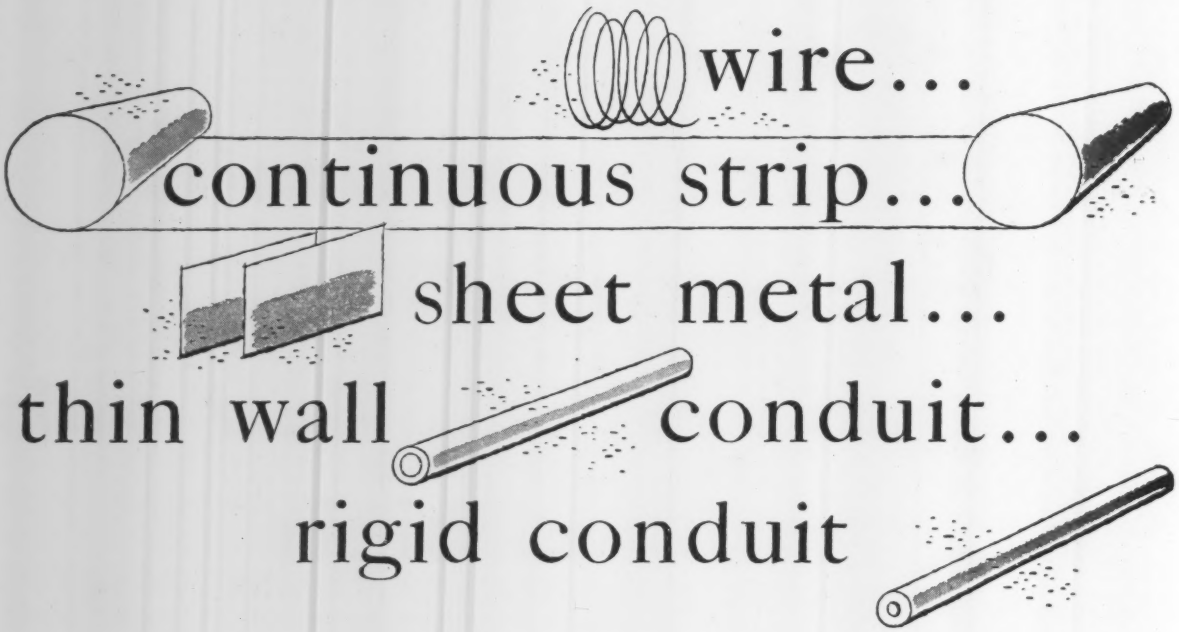
Your local Authorized Distributor of Carboloy cemented carbide products stocks standard tools, blanks, inserts, and toolholders in styles and sizes for every job or machine. He'll give you fast delivery, and expert technical assistance.

Call him today (you'll find his name in the Yellow Pages of your phone book). Or write: *Metallurgical Products Department of General Electric Company, 11141 E. 8 Mile Street, Detroit 32, Michigan.*

CARBOLOY®
CEMENTED CARBIDES

GENERAL ELECTRIC

IF YOU PROCESS...



wire...

continuous strip...

sheet metal...

thin wall conduit...

rigid conduit

YOU CAN *Automate* ALL THESE OPERATIONS:

- cleaning
- pickling
- plating
- phosphating
- scrubbing
- paint prep
- electrogalvanizing

For Faster, Better Production . . . At Far Less Cost
with an

H-VW-M CONTINUOUS LINE SYSTEM

WRITE today, at no obligation, for the facts about an H-VW-M System that can bring cost-saving *automation* to your continuous line finishing—a system that can be integrated with your shearing, forming, slitting or annealing operations.

Hanson-Van Winkle-Munning Company, Matawan, New Jersey. Offices in principal cities.

H-VW-M

Industry's Workshop for the Finest in Plating, Anodizing, and Polishing Processes • Equipment • Supplies

PLATEMANSHIP –Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

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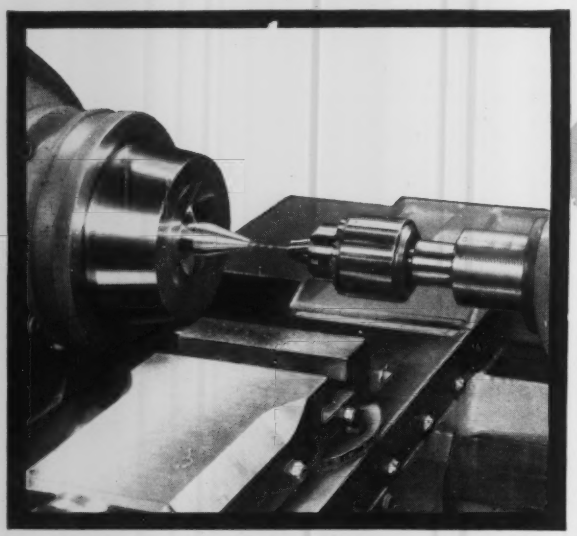
The strategic location of our manufacturing facilities, sales offices and warehouses, assures efficient handling of your ferro-alloy needs

PLANTS Philo, Ohio, Brilliant, Ohio and Tacoma, Washington SALES OFFICES Birmingham, Chicago, Detroit, Los Angeles, Philadelphia, Pittsburgh, San Francisco, Seattle WAREHOUSES Denver, Los Angeles, Minneapolis, Oakland, Salt Lake City, Mexico City and Vancouver, B. C., Canada

We invite your inquiry

Ohio Ferro-Alloys Corporation
Canton, Ohio

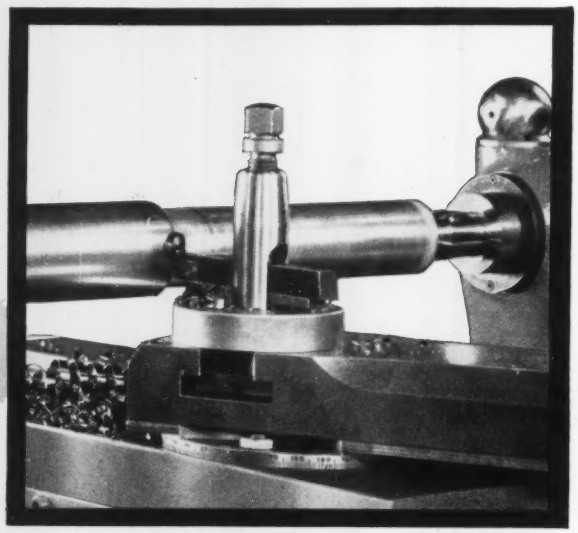
Rivett's 2 for 1 Lathe!



Sensitive...

As An Instrument Lathe

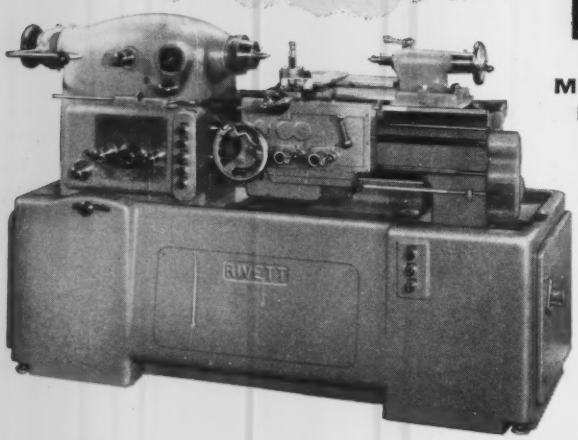
Responds to the lightest touch of the operator. Turns within .0004" in 12" length!



POWERFUL...

As An Engine Lathe

Full horsepower transmitted to spindle. Takes ¼" chip with .020" feed on cold rolled steel.



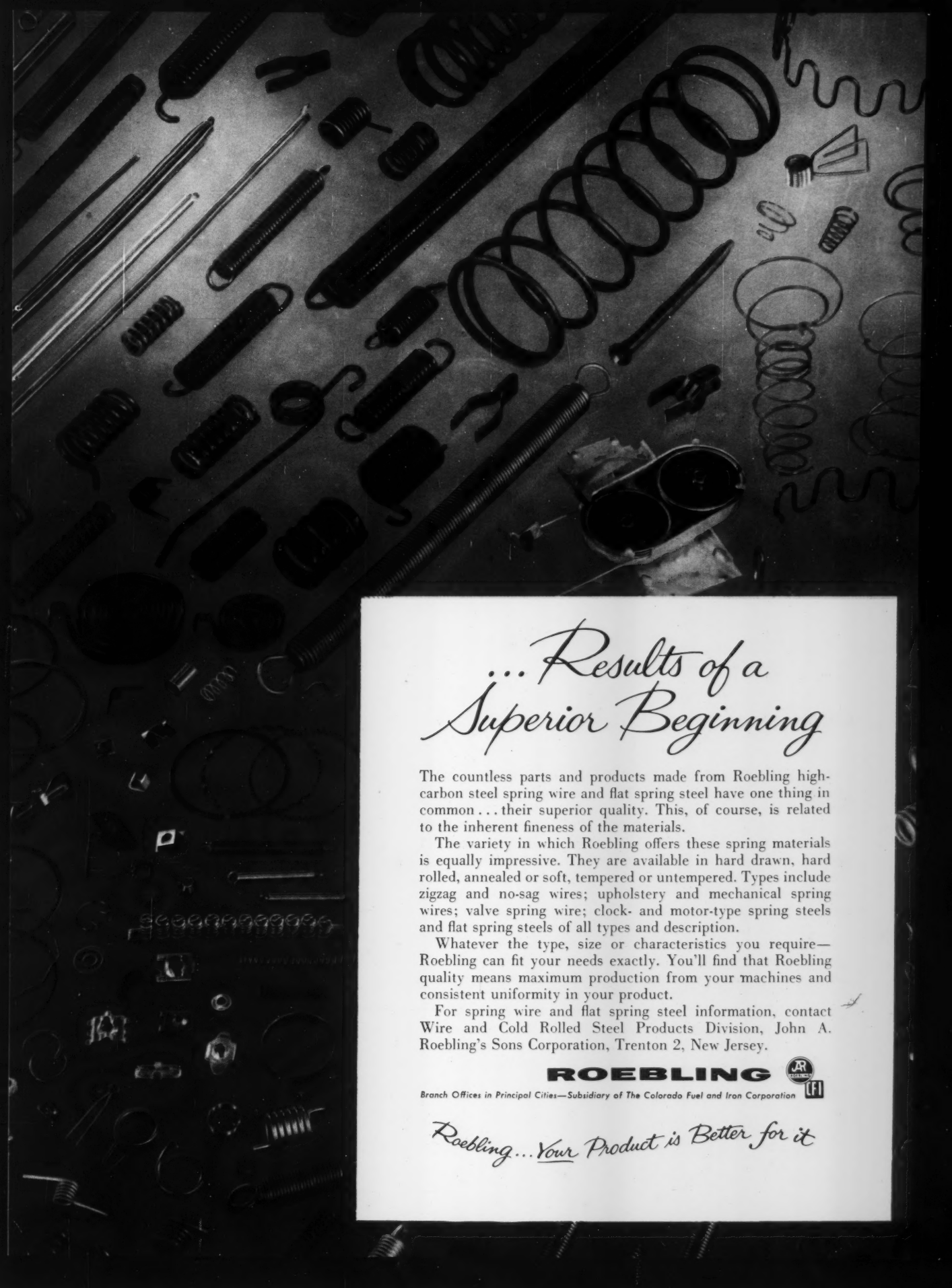
Model 1020S "Steelway" PRECISION TOOLROOM LATHE

This lathe has the industry talking! Because of extreme precision, it has long been recognized as the top tool by master mechanics. Now, its adaptability and broad usefulness have highlighted its productivity. As one satisfied user states, "Our toolmakers go to a Rivett first in preference to our other lathes!"

RIVETT LATHE & GRINDER, INC.
Dept. ST-8, Brighton 35, Boston, Mass.

Go to Rivett now for information about this big, beautiful machine.
Send for bulletin 1020B.

RIVETT
"Steelway" Lathes



... Results of a Superior Beginning

The countless parts and products made from Roebling high-carbon steel spring wire and flat spring steel have one thing in common . . . their superior quality. This, of course, is related to the inherent fineness of the materials.

The variety in which Roebling offers these spring materials is equally impressive. They are available in hard drawn, hard rolled, annealed or soft, tempered or untempered. Types include zigzag and no-sag wires; upholstery and mechanical spring wires; valve spring wire; clock- and motor-type spring steels and flat spring steels of all types and description.

Whatever the type, size or characteristics you require—Roebling can fit your needs exactly. You'll find that Roebling quality means maximum production from your machines and consistent uniformity in your product.

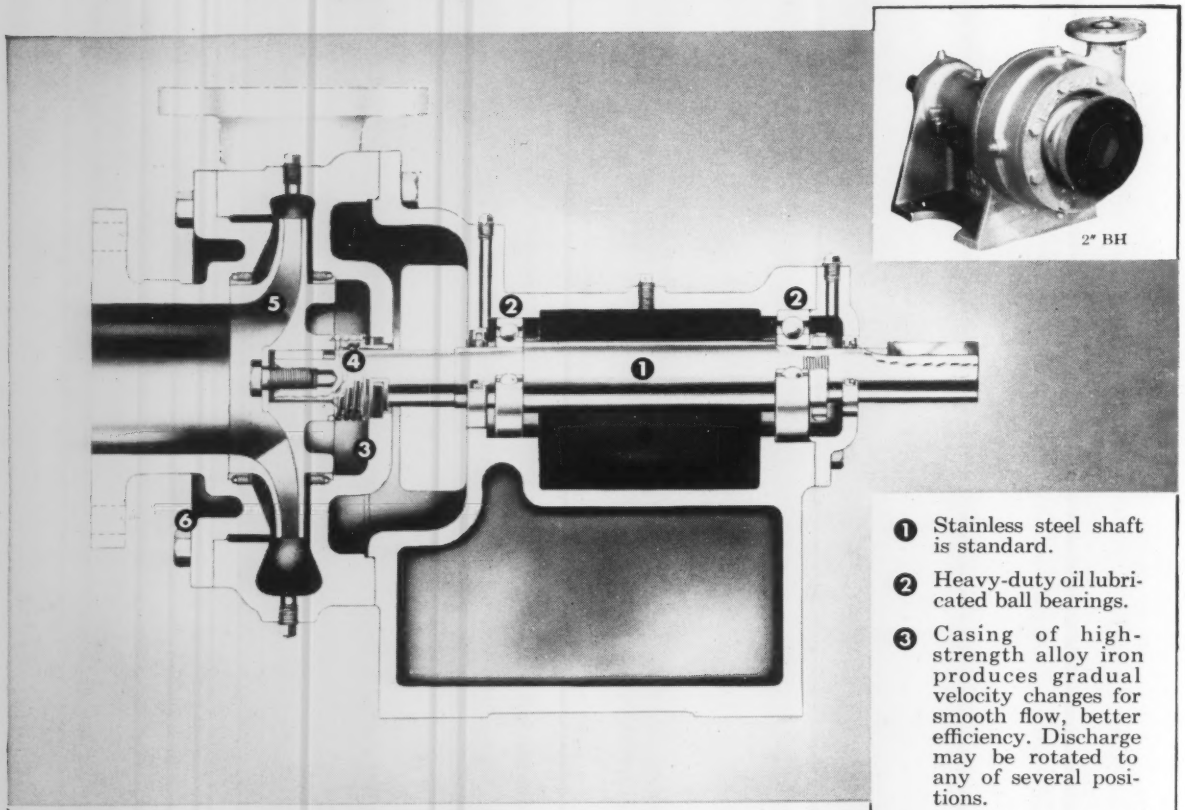
For spring wire and flat spring steel information, contact Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities—Subsidiary of The Colorado Fuel and Iron Corporation

Roebling... Your Product is Better for it

New high speed, high head centrifugal pumps ... the Gardner-Denver BH line



1. Stainless steel shaft is standard.
2. Heavy-duty oil lubricated ball bearings.
3. Casing of high-strength alloy iron produces gradual velocity changes for smooth flow, better efficiency. Discharge may be rotated to any of several positions.
4. Mechanical seal for long life without attention.
5. Hydraulically balanced bronze impeller.
6. Casing cover readily removed for impeller inspection.

Quality inside improves useful output

BH PUMP RATINGS

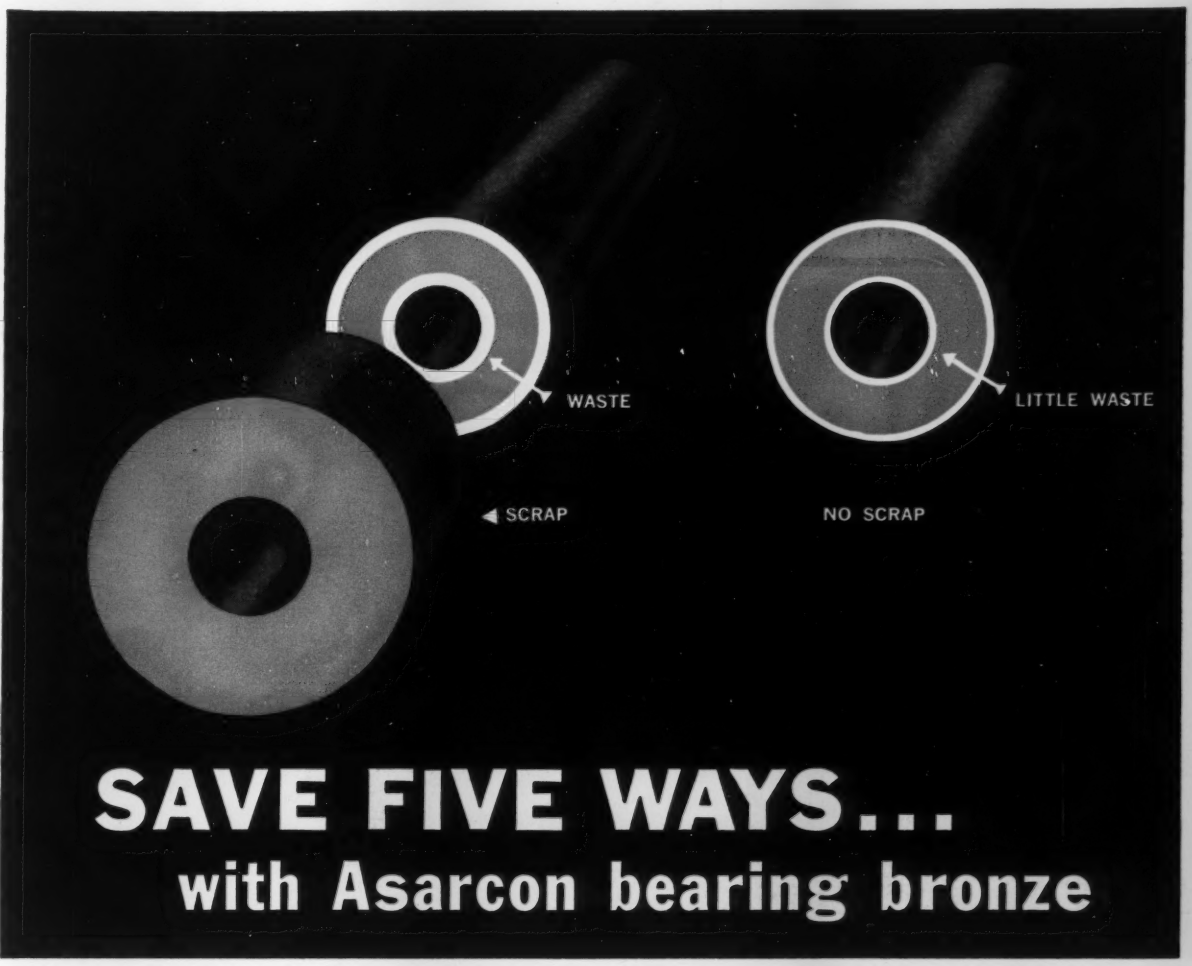
SIZE	HORSEPOWER	SPEED RANGE IN RPM	CAPACITY RANGE IN GPM
1"	1 to 10	1450 to 3460	55 to 150
1½"	1½ to 20	1450 to 3460	110 to 220
2"	2 to 25	1450 to 3460	170 to 440
3"	3 to 40	1450 to 3460	340 to 520

For complete information on these new Gardner-Denver BH centrifugal pumps, write for Bulletin 2-2e.

ENGINEERING FORESIGHT—PROVED ON THE JOB
IN GENERAL INDUSTRY, CONSTRUCTION, PETROLEUM AND MINING

GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario



SAVE FIVE WAYS...
with Asarcon bearing bronze

1 Cut short-end scrap up to 48%! Buy Asarcon 773 (SAE 660) and forget short-end scrap problems created by the standard 13" bar. You order Asarcon 773 in the **exact** length you need — all the way up to 105"! And you save on handling and inventory costs at the same time.

2 Save almost ⅓ on diameter losses! Buy Asarcon 773 and instead of ¼" clean-up allowances, you have only 1/32" to 3/32" to machine. If you're currently using rough-cast bars, you may now be throwing away ⅓ the metal you buy! (Not to mention the waste if you buy solid bars and bore them out!)

3 4 5 Save these three other ways: Buy Asarcon 773 and you save on machining time, since there's far less metal to remove. Buy Asarcon 773 and you get better service and longer life from your bearings — there are no blow-holes, pits, shrinks, sand or other foreign matter to cause trouble.

Buy Asarcon 773 and you save on down-time — because you get greater yield strength, impact strength and fatigue strength than in the same alloy cast by any other method!

In short, buy Asarcon 773, and watch bearing costs tumble! For more information, talk to your local independent Asarco distributor, who stocks Asarcon 773 in 260 sizes of solids and tubes — or write us directly, and we'll demonstrate how others are saving with Asarcon 773.

ASARCO

Continuous-Cast Products Department

AMERICAN SMELTING AND REFINING COMPANY

Perth Amboy Plant, Barber, New Jersey • Whiting, Indiana

WEST COAST SALES AGENT: Kingwell Bros. Ltd., 457 Minna St., San Francisco IN CANADA: Federated Metals Canada, Ltd., Toronto and Montreal

Among the thousands of users—

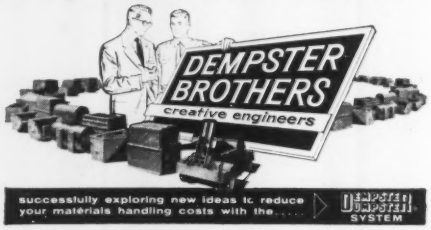
THE DEMPSTER DUMPSTER® SYSTEM

Also Performs Important Materials Handling Jobs for this Prominent Electrical Manufacturer

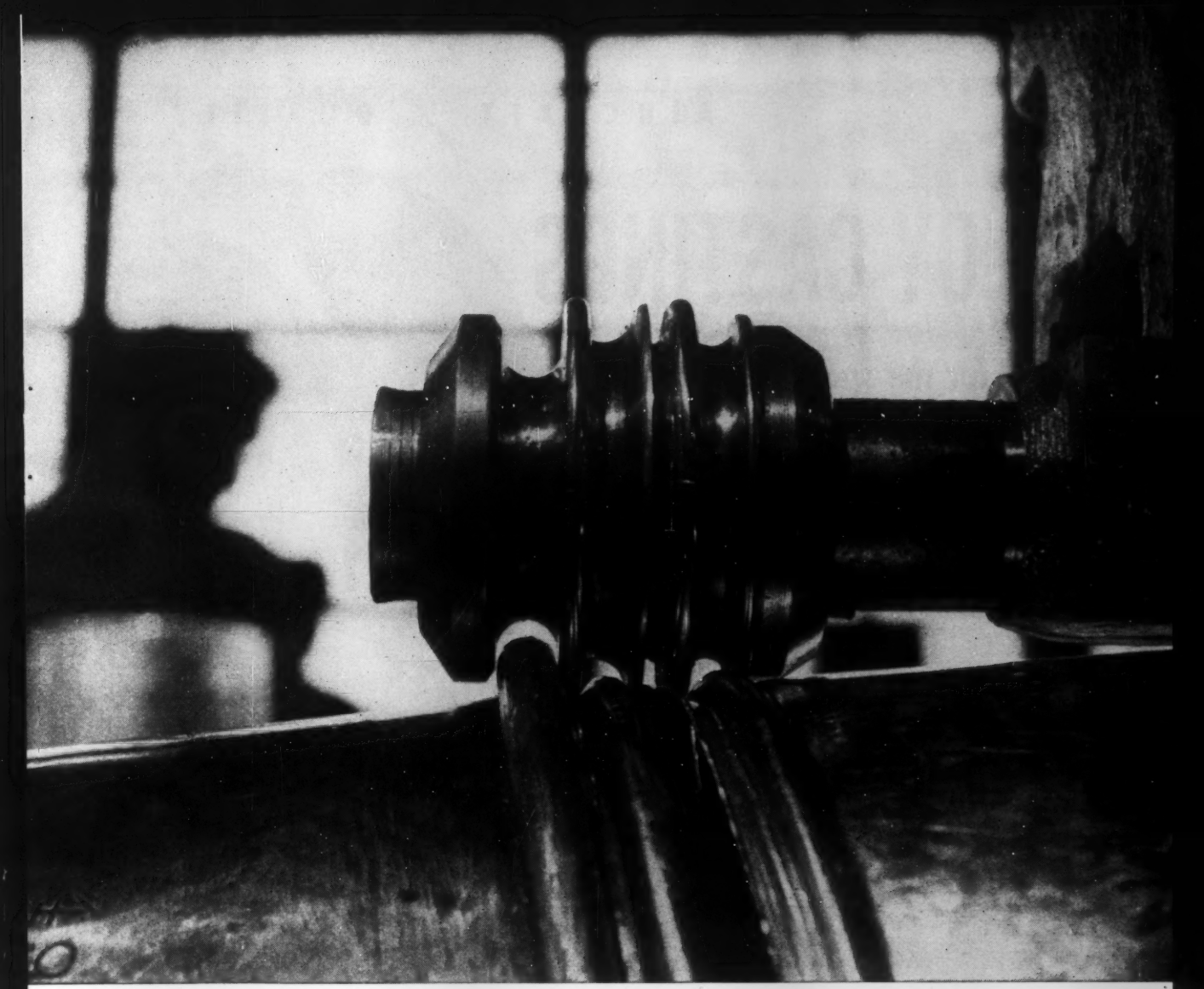
One major use of the Dempster-Dumpster System in a large General Electric plant is for scrap materials collection. The Dempster-Dumpster Detachable Containers are placed in various areas, such as wire preparation and parts fabrication. When they are filled the truck-mounted Dempster-Dumpster, operated by only one man, the driver, picks up load, hauls and dumps in their scrap and salvage area . . . handling one-container-after-another. In a similar manner, this amazing low cost system also is used to collect waste materials around this factory. We at Dempster Brothers are proud to name the General Electric Company among the thousands of users of the Dempster-Dumpster System.

You, too, can reduce your bulk materials handling cost with this modern method — a flexible system that (1) enables you to obtain and use any required number of containers, each in the design and size to meet different material requirements, and (2) collect, haul, dump and/or transfer materials of every description with one truck-mounted Dempster-Dumpster operated by only one man, the driver. Write us today for complete information. Manufactured by Dempster Brothers, Inc.

THERE IS A DEMPSTER-DUMPSTER DETACHABLE CONTAINER AVAILABLE OR THAT CAN BE BUILT TO SUIT THE MATERIAL— be it solid, liquid, dusty, combustible, high temperature . . . waste or salvable, raw or finished product, and each, regardless of size up to 21 cubic yards or capacity up to and over 36,000 lbs. payload, can be handled by one truck-mounted Dempster-Dumpster with only one man, the driver! Savings are tremendous!



DEMPSTER BROTHERS, 687 Dempster Bldg., Knoxville 17, Tennessee



"NO MATTER HOW TOUGH THE FABRICATING JOB, WEIRKOTE'S® ZINC COATING STAYS PUT!"

Weirkote users know *that* as well as they know their own names. And no wonder! Look how profitably Weirkote zinc-coated steel fits into a fabrication operation.

Weirkote has the tight, continuous-process zinc coating that can stand up to every fabrication procedure, bending, crimping, twisting, lock seaming, the deepest draws, and *stay* tight. No flaking or peeling problems. Far less chance of hidden flaws or only temporary corrosion resistance in the finished product.

In a nutshell, we produce a zinc-coated steel sheet that enables you to give your customers even more built-in value for their dollars. You simplify your production problems and make some important cost savings at the same time.

Why wait? Find out how Weirkote's corrosion resistance, strength and ability to come through severest fabrication stresses unblemished, can help you. For free booklet write to Weirton Steel Company, Dept. B-4, Weirton, West Virginia.

WEIRTON STEEL COMPANY

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

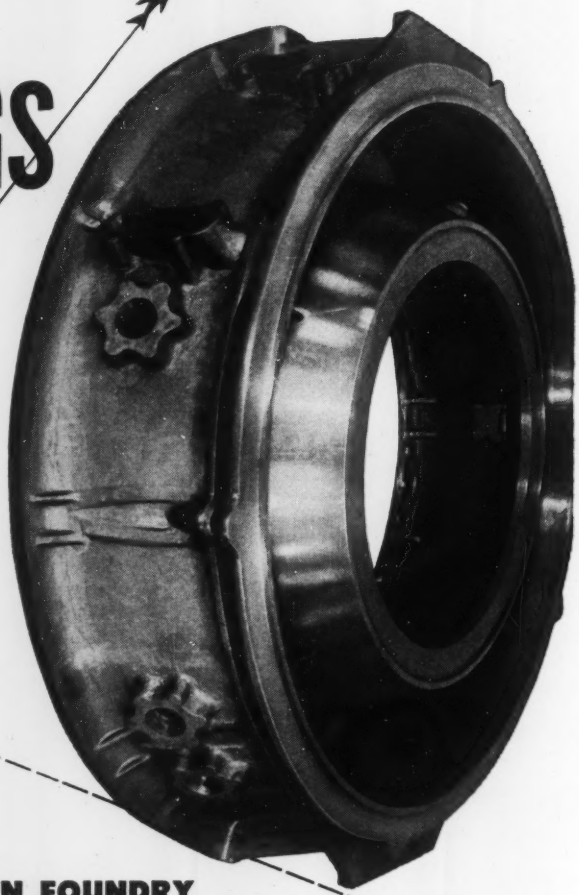
a division of

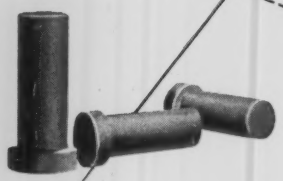
NATIONAL STEEL CORPORATION

AIRCRAFT QUALITY

ALLOY CASTINGS

...for the special requirements of your industry





METALS PROCESSING DIVISION FOUNDRY handles wide range of sizes, closely controls dimensions

Precision testing methods provide close control of casting quality

Curtiss-Wright's Metals Processing Division today offers your industry precision castings of critical parts in a wide variety of sizes, and with closely controlled dimensions. For example, in the large casting shown, tolerance is ±.030 over 36″ diameter. From its modern, completely equipped foundry in Buffalo, the Division supplies heat, corrosion and abrasion resistant castings from a full range of special-property alloys, including ductile iron... by sand, centrifugal, ceramic or shell processes.

Precision alloying techniques, modern melting controls with spectrometer testing, X-ray control by experienced radiographers – all add up to castings with superior physical and mechanical properties . . . mean better and more dependable products for the critical needs of industry. Qualified design engineering assistance is a part of the comprehensive Metals Processing Division service. Write for details.

80 Grider Street

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CURTISS-WRIGHT
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Metals Processing Division Branch Offices: New York • Houston • Los Angeles

(Advertisement)

Glidden doubles production...thanks to GAS

During the last few months, production of polyester resins and other paint bases at the Glidden Company's Wilhelm Division, Reading, Penna., has been doubled—thanks to their new Gas-fired, radiant batch furnace designed and installed by Blaw-Knox Company.

The location of the Gas burners and the arrangement of the furnace interior surface are engineered to radiate evenly diffused heat to the exposed surface of the kettle. This design assures Glidden of accurate temperature control, significant fuel savings, low initial investment and low maintenance. From a cold start, this Gas furnace can reach full operating temperature in a matter of minutes . . . and cool within 30 seconds after the Gas supply is shut off—perfect controllability.

For information on how you can achieve similar savings and efficiency in your production operations, contact your Gas Company's Industrial Specialist who will be glad to discuss the advantage of Gas and Gas-fired industrial equipment with you. *American Gas Association.*

See Playhouse 90 with Julia Meade on CBS-TV. Watch local listings for time and station. Sponsored by your Gas Company and the Gas Industry.

3 WAYS YOU CAN KEEP AHEAD OF COMPETITION

A BETTER PRODUCT . . . AT LESS COST . . . through ADVANCED GAGING!

Profit margins aren't getting any better . . . just the opposite. It's no longer a matter of "getting the stuff out". The problem now is making it *better at lower cost.* Advanced gaging—by FEDERAL—can do it. The gaging ideas are proven profit makers. The gages, far from being monsters of automation, are compact, standardized units, realistically designed to provide automatic control or inspection, or both, where it does the most good and at a price that almost *every* manufacturer can afford. And they have reliability . . . the most important single feature of FEDERAL Gaging.

Whether you're big or small in terms of production, *at least one of these gaging arrangements can pay off for you.* It's the truth. Ask us to prove it. Write:

FEDERAL PRODUCTS CORPORATION
7218 Eddy Street • Providence 1, Rhode Island

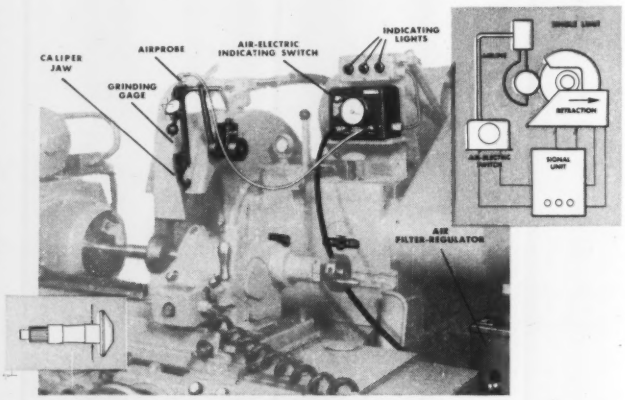
① AUTOMATIC CONTROL OF FINISH SIZE

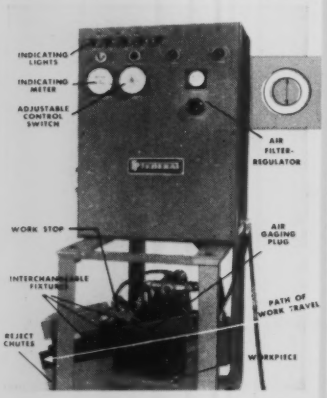
This standardized control gage continuously measures and indicates size of work as it is being ground and automatically causes wheel to retract the instant finish size is reached. Unit can be easily applied in the field to any center type grinder having hydraulically controlled wheel slide.

BENEFITS: Reduces costs — one operator handles two, possibly three grinders performing the same or different operations. Gages pay for themselves within a few months.

Improves quality — even if you have only one grinder, gage is a profit-maker because it eliminates error due to operator inattention or fatigue and also eliminates cost of later inspection.

VARIATIONS: Similar FEDERAL Gages are available through machine tool manufacturers to change wheel feed rate to dwell grind also . . . or to control dressing cycle and finish size on I.D. grinders. When specifying machine tool requirements be sure to include Federal gaging.

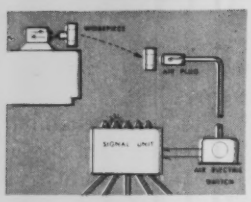




② AUTOMATIC 100% INSPECTION

This standardized "post-process" gage inspects every part as it is discharged from the machine and sorts work into "good", "*near*-over", "*near*-under" plus "salvage" and "scrap", indicating the size of each piece. Operator can compensate for drift and piece-to-piece variation *before any scrap parts are produced.* Can be applied to any type I.D. or O.D. grinder, lathe, boring machine or screw machine.

BENEFITS: Lower cost per part. Virtually eliminates scrap by showing trend *before* tolerance limits are reached.
Eliminates inspection errors — gage has 99.8% reliability or better.



VARIATIONS: Federal Gages of similar type are available through machine tool manufacturers to also provide automatic compensation of the machine, either proportionally or by increments, so that drift is corrected without need for operator attention. Be sure to specify Federal Gaging when buying machine tools.

③ SEMI-AUTOMATIC, MULTIPLE DIMENSION MEASUREMENT

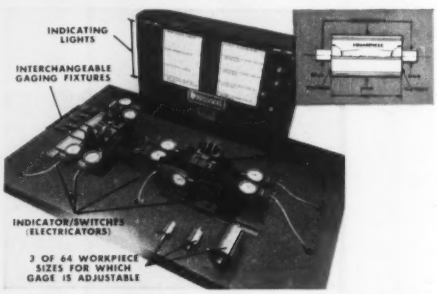
Ideal for small and medium production manufacturers, this gage checks nine dimensions in two stations and is adjustable for 64 sizes! Work is loaded and disposed of manually. Lights show "good", "over" and "under".

BENEFITS: Reduces non-productive costs—inspection time per part is reduced 75%.

Improves quality level. Permits profitable 100% inspection.

Inspection can be performed by less skilled personnel.

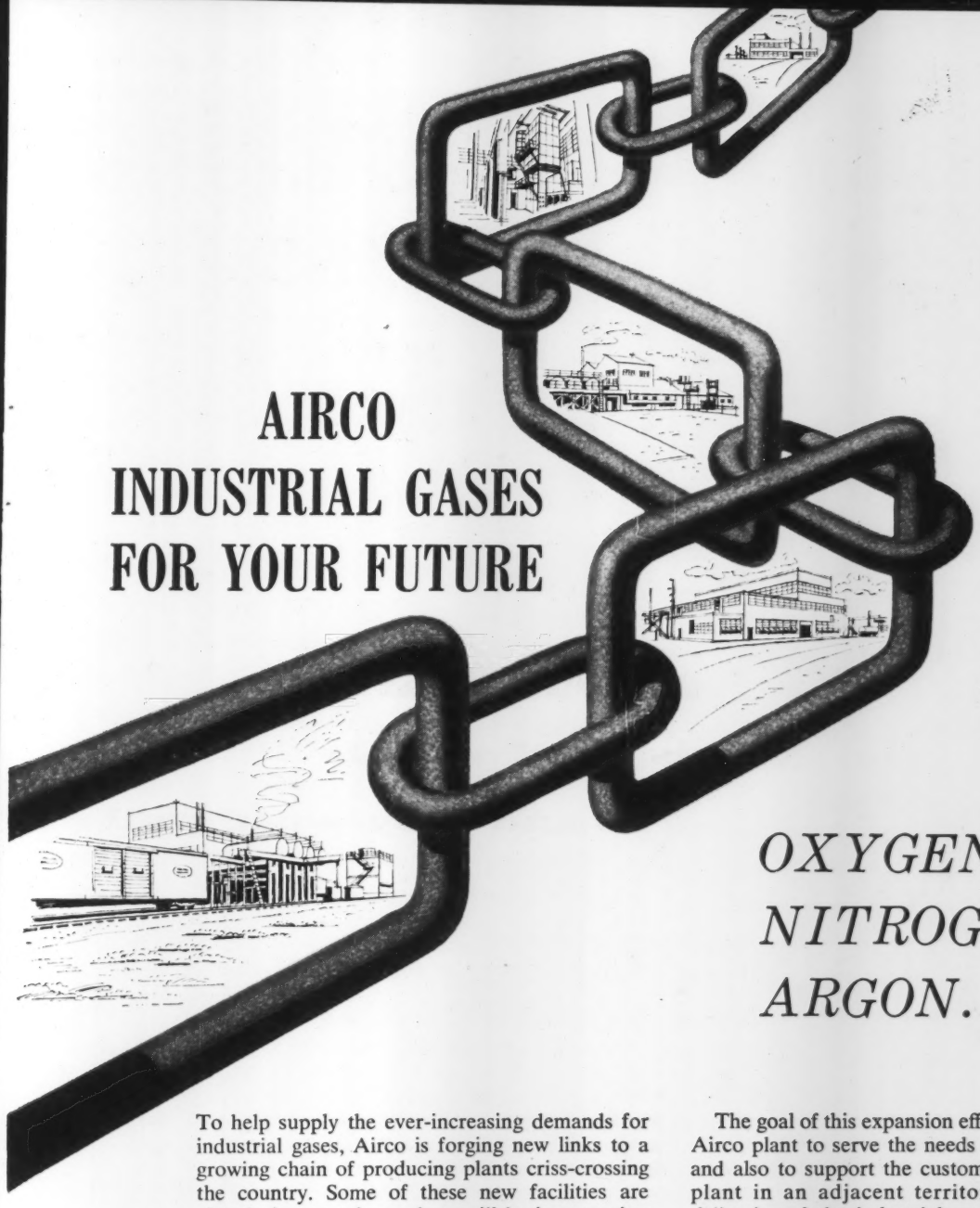
VARIATIONS: Can be designed to provide virtually any combination of dimensional measurements. Unit can incorporate semi-automatic disposal. Other design possibilities up to a completely automated inspection and control gage.



Ask FEDERAL *First*

FOR RECOMMENDATIONS IN MODERN GAGES . . .

Dial Indicating, Air, Electric, or Electronic — for Inspecting, Measuring, Sorting, or Automation Gaging



AIRCO INDUSTRIAL GASES FOR YOUR FUTURE

OXYGEN...
NITROGEN...
ARGON...

To help supply the ever-increasing demands for industrial gases, Airco is forging new links to a growing chain of producing plants criss-crossing the country. Some of these new facilities are already in operation, others will be in operation by the latter part of this year. This multimillion dollar construction program will greatly increase our capacity to supply your present and future requirements for oxygen, nitrogen, argon and other gases.

The goal of this expansion effort is to gear each Airco plant to serve the needs of its own area—and also to support the customers of any Airco plant in an adjacent territory by providing deliveries of the industrial gases needed in the quantities required.

The services Airco offers its customers are well worth your consideration. Let your nearest Airco office help plan the most economical gas supply for your needs and the most efficient way to use it.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND . . .

AIRCO®

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AIR REDUCTION SALES COMPANY

A division of Air Reduction Company, Incorporated
150 East 42nd Street, New York 17, N. Y.

On the west coast—
Air Reduction Pacific Company

Internationally—
Airco Company International

In Cuba—
Cuban Air Products Corporation

In Canada—
Air Reduction Canada Limited

Products of the divisions of Air Reduction Company, Incorporated, include: **AIRCO** — industrial gases, welding and cutting equipment, and acetylenic chemicals • **PURECO** — carbon dioxide — gaseous, liquid, solid ("DRY-ICE") • **OHIO** — medical gases and hospital equipment • **NATIONAL CARBIDE** — pipeline acetylene and calcium carbide • **COLTON** — polyvinyl acetate, alcohols, and other synthetic resins.

They're wearing his "hat" wheels* ...and they wear well

Bay State abrasive engineer Don Kennedy put in enough years in the Navy to learn about rust removal and other grinding jobs the hard way. Whatever your company's grinding problems may be, you'll find Bay State representatives like Don Kennedy ready to help and competent to work out practical solutions.

When Bay State's now-famous *"hat" wheels** were first introduced at a large East Coast shipyard, they caused quite a sensation. Here were revolutionary new grinding wheels that tore off metal like cup wheels but were much less heavy . . . that handled as easily as coated abrasive discs but cut faster, lasted longer and did more work at lower cost.

In addition to outstanding product performance, however, Bay State offers prompt, intelligent service. Sales engineer Don Kennedy not only works with top supervisors; he gets out on the job with the operators and digs into their problems, too.

As a result, his recommendations are both practical and specific . . . Blue Flash for speed and heavy stock removal . . . Bayflex to resist loading on soft metals . . . Saf-T-Cut for longer life on hard, jagged surfaces . . . DuraCut for blending and finishing broad areas.

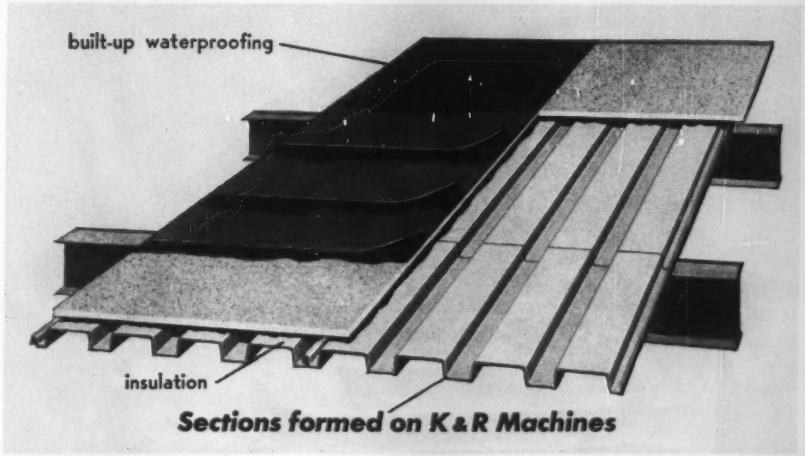
** Raised hub disc wheels, reinforced for extra safety.*

BAY STATE WHEELS of PROGRESS

BAY STATE ABRASIVES

Bay State Abrasive Products Co., Westboro, Massachusetts
Branch Offices and Warehouses: Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh. *Distributors:* All principal cities. Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ontario.

THIS is the way "Robertson" forms STEEL DECK FLOORING



Sections formed on K & R Machines

To meet the heavy demand for their Q Deck #3 and other sections

H. H. ROBERTSON

has installed the new production line shown.

The forming of these sections is accomplished by the use of three K & R forming machines *(arranged in straight line production)* consisting of one 14 stand and two 4 stand K & R No. 5LS Cold Rolled Forming Machines.

K & R PRODUCTS

- ★ Straightening Rolls
- ★ Bending Rolls
- ★ Cold Roll Forming Machines
- ★ Gang Slitters ★ Flying Shears
- ★ Crimping Machines
- ★ Hydraulic Tube Benders
- ★ Hydraulic Bulldozers
- ★ Hydraulic Presses
- ★ Edging Machines
- ★ Special Metalworking Equipment

Learn how K&R Machinery can cut costs and boost production in your plant. Our engineers will furnish recommendations, operating data, estimates — no cost, no obligation. Write or wire today.

K & R

Kane AND ROACH, INC.

SYRACUSE, NEW YORK • ESTABLISHED 1887

Westinghouse motors double normal life for this application

. . . at Ohio-Apex Div., Food Machinery and Chemical Corp.

this standard Life-Line A motor still pumping corrosive POC I_3 after 12 continuous months without maintenance or down time.

"We must have a dependable motor, completely sealed and corrosion-resistant," says Mr. Burton Fitch, Ohio-Apex Division of Food Machinery and Chemical Corporation, Nitro, West Virginia. "A corrosive atmosphere, plus phosphorous oxychloride drip and seepage, cuts motor life. Westinghouse Life-Line® "A" motors have already passed this replacement point twice . . . and are still going strong."

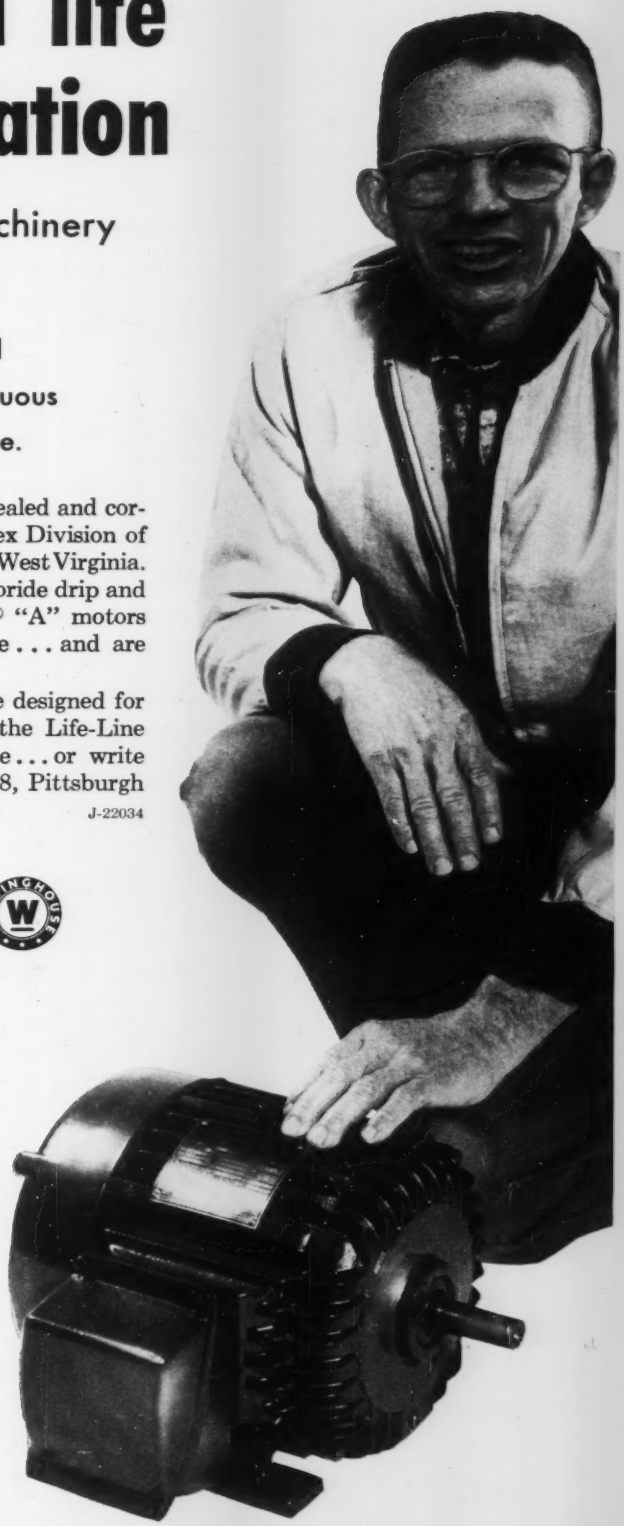
Westinghouse motors last longer because they're designed for modern industry's needs. For more facts about the Life-Line "A", call your local Westinghouse representative . . . or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-22034

YOU CAN BE SURE . . . IF IT'S

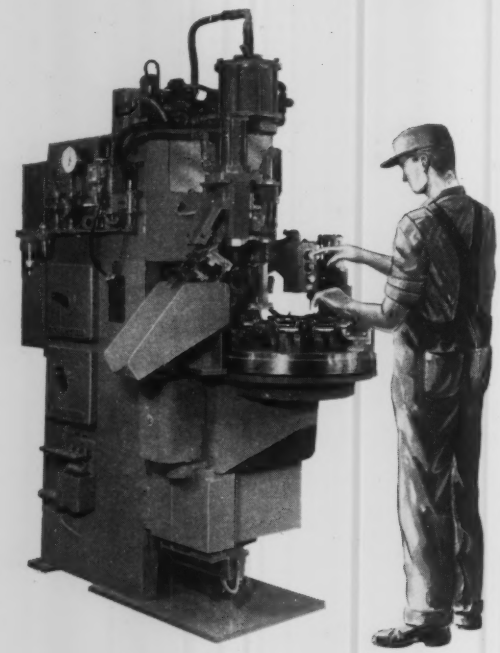
Westinghouse

"Westinghouse Life-Line "A" motors have cut our motor costs substantially . . . helped us keep our chemicals moving down the line," says Mr. Fitch of Ohio-Apex. "Their built-in ruggedness, plus foolproof sealing against corrosion, means longer life, lower maintenance."



Unretouched photo of Life-Line "A" three-hp motor driving chemical pump at 1730 rpm, 100 gpm at Ohio-Apex.

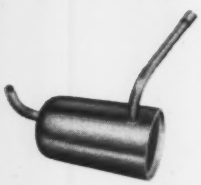
Muffler Assemblies at 1800/hr.
with T-W Resistance Welder



An appliance manufacturer welds mounting braces to refrigerator mufflers at a rate of 1800 assemblies per hour with this Taylor-Winfield dial feed resistance welder. It speeds production and cuts unit cost by continuous loading and multiple automatic operations.

The operator loads two sets of parts in one station of the dial table. They revolve through automatic stations where they are checked for proper position, resistance welded and ejected from the welder. The operator loads continuously while these operations take place.

T-W worked with product design engineers to solve the problem of welding solid round bar stock to a cylinder sealed at both ends. Two projections were pinched in the bar stock to achieve uniformly strong welds without an electrode in the muffler interior.



Taylor-Winfield has designed and built more dial feed welders than any other manufacturer. These and many other types of T-W welders can cut your assembly costs. For prompt attention to your weld production problems, contact the nearest T-W branch office.

The **TAYLOR·WINFIELD** *Corporation* Warren, Ohio

ELECTRIC RESISTANCE AND ARC WELDING MACHINES

Sales and Service

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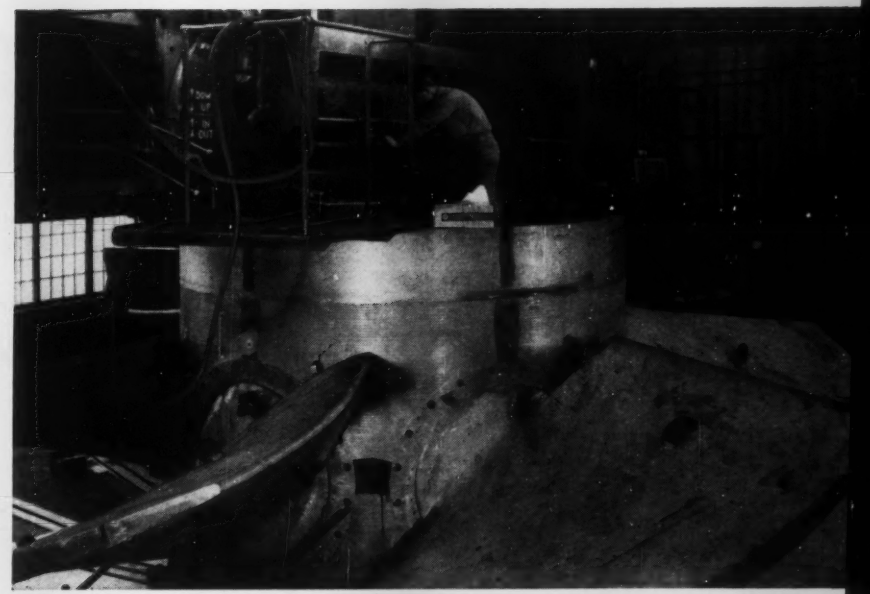


Scott Wipers* are used to clean the feeder screw of this 42′ vertical boring mill, one of the largest in the East. Other wiping jobs: all kinds of metal cutting machines, tools, instruments, stock, hands, face, glasses.

*PATENT PENDING

WIPER PROBLEM? Look what Baldwin-Lima-Hamilton did with Scott Wipers!

The Southwark shop of BLH's Eddystone Division, Philadelphia, makes giant machinery, hydro-electric turbines, parts for Diesel engines, dump cars. Cloth wipers had to be dispensed from a central tool crib—caused lost time, and laundry, storage and handling expense. They turned to Scott Wipers . . . to help reduce these problems.

Scott Wipers are easily stored in each work area. Fresh from the box, they hold no foreign particles to cut or scratch. They're easily disposed of, after use. Their use has resulted in substantial savings in *production hours*, as well as in material costs. And workers who use them. like them!

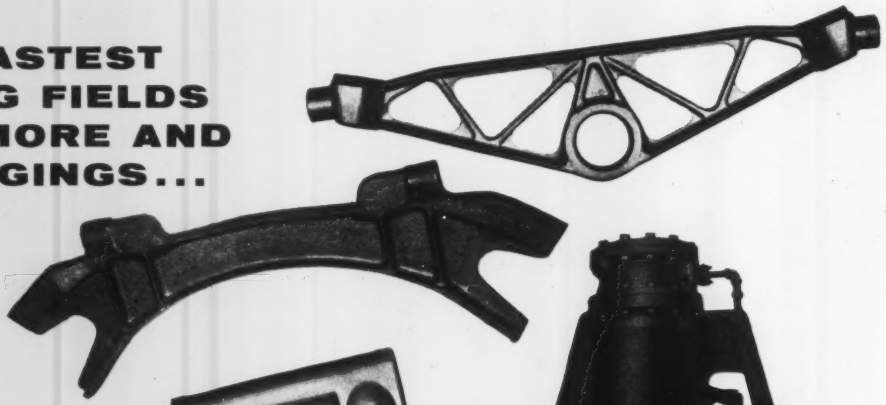
Soft, absorbent Scott Wipers are 2-ply, for extra strength. Chemically treated for proper wet strength. Lint-free, odorless, and Perf-embossed,® a special process that gives thorough cleaning action, faster liquid absorption. For more details, call your local Scott distributor, or write Scott Paper Company, Department S-78, Chester, Pennsylvania.

SCOTT PAPER COMPANY

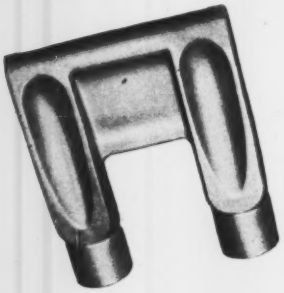
Makers of the famous Scott paper products you use in your home. Consult TV schedules for Scott's program, "Father Knows Best."

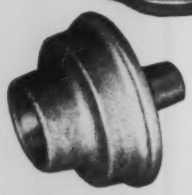
TODAY'S FASTEST EXPANDING FIELDS REQUIRE MORE AND MORE FORGINGS...

FOR INSTANCE—



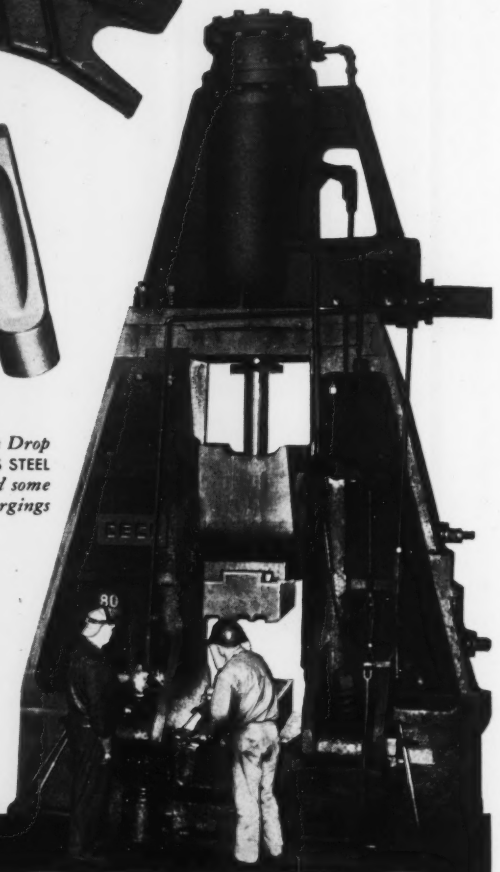
AIRCRAFT





ROAD BUILDING

TRUCKING

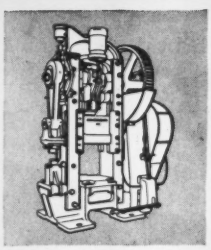


One of the four Chambersburg Steam Drop Hammers at TRANSUE AND WILLIAMS STEEL FORGING CORP., ALLIANCE, OHIO *and some of the* TRANSUE AND WILLIAMS *forgings produced on these hammers.*

CHAMBERSBURG STEAM DROP HAMMERS

BUILT TO HANDLE MODERN FORGING REQUIREMENTS—*WITH HIGHER PRODUCTION—LOWER COSTS*

Cost per piece produced is the only true test of a hammer's worth and the only true basis for appraising its various features. Every feature of the Chambersburg Steam Drop Hammer is designed and built with but one objective—to produce forgings at the lowest cost per piece, whether that cost be on a basis of the piece in its forged or in its machined state. Write for Bulletin No. 55-L-4.



A rugged—low maintenance teammate is the practically indestructible Chambersburg Steel Side Trimming Press.

CHAMBERSBURG ENGINEERING COMPANY · CHAMBERSBURG, PA.

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Waterville 14, Connecticut
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39 Sources

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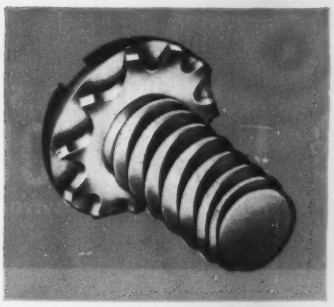
a first step in mass-assembly savings

Sems

pre-assembled screw and lock washer

Pre-assembled SEMS save separate washer handling, save lost or forgotten washers, save rejects due to mis-matched screw and washer. Can be hopper fed for automatic driving. Available in many types and varieties.

Specify SHAKEPROOF® Lock Washers when ordering SEMS. Designed for a perfect match, they lock tight, stay tight, guard against loosening vibration.



SEMS is a development of Illinois Tool Works, Chicago

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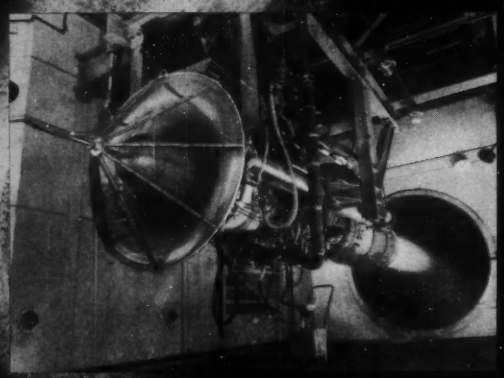
BISHOP TUBING



Photograph of J57 Engine undergoing test Courtesy, Ford Motor Co., Aircraft Engine Division

is used by Ford Motor Company's Aircraft Engine Division

Aircraft, rocket and missile manufacturers are today concerned with greater endurance and finer performance of their aircraft assemblies and parts.

Bishop Tubing meets these rigid requirements against corrosion, high temperatures, resistance to oxidation, vibration, stress and shock so that most aircraft manufacturers are today using *Bishop Tubing* as set forth in the ASM, ASTM, MIL-T and AN-WW-T specifications.

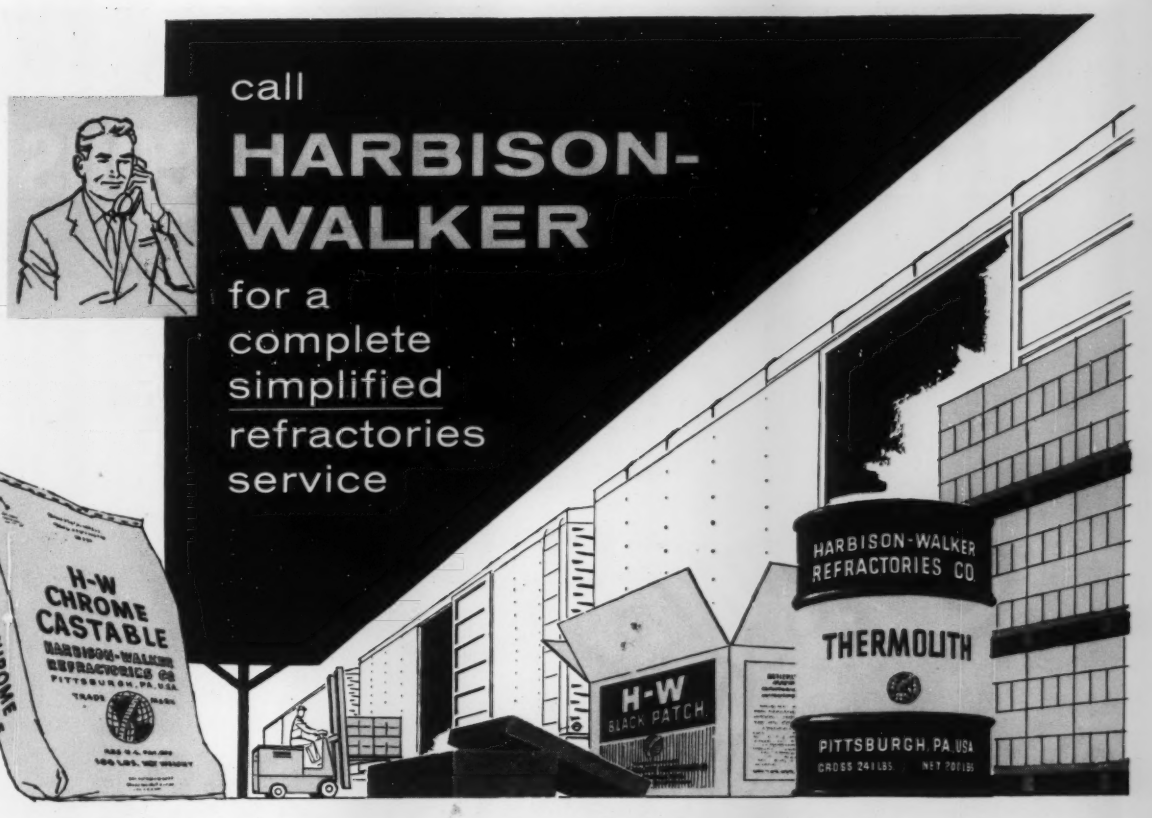
You, too, can specify Bishop Tubing on your next order.

Manufacturers of: Seamless and Welded and Drawn Stainless Steel Tubing (.008" to 1" OD), Mechanical, Capillary, Hypodermic and Aircraft Grade. Nickel and Nickel Alloy Tubing (up to .625" OD) Tubular Fabricated Parts, Glass-to-Metal Sealing Alloys, Clad Metals & Composite Wires, Platinum Group Metals and Chemicals, **Catalogs on Request**

STAINLESS STEEL PRODUCTS DIVISION

J. BISHOP & CO. Platinum Works

Malvern, Pennsylvania Malvern 3100



ASSURES BALANCED SELECTION

SAVES TIME and MONEY

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to Harbison-Walker can take care of your entire needs. The complete range of H-W products includes prefired and chemically bonded brick and shapes . . . Plastics . . . Castables . . . Insulating materials—in types and classes for *all* service conditions and *all* applications. For whatever you require, one call frequently simplifies your ordering procedures.

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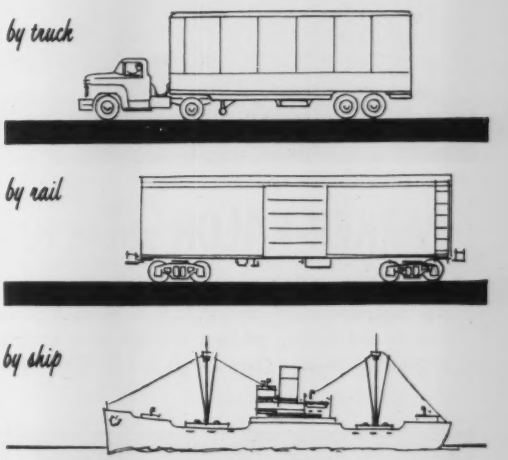
often feasible, are both convenient and economical since transportation and handling time and costs are kept to a minimum. And Harbison-Walker's Technical Service Department helps provide for the most advantageous selection of refractories for each specific furnace requirement.



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GENERAL OFFICES: PITTSBURGH 22, PENNSYLVANIA
The World's Most Complete Refractories Service

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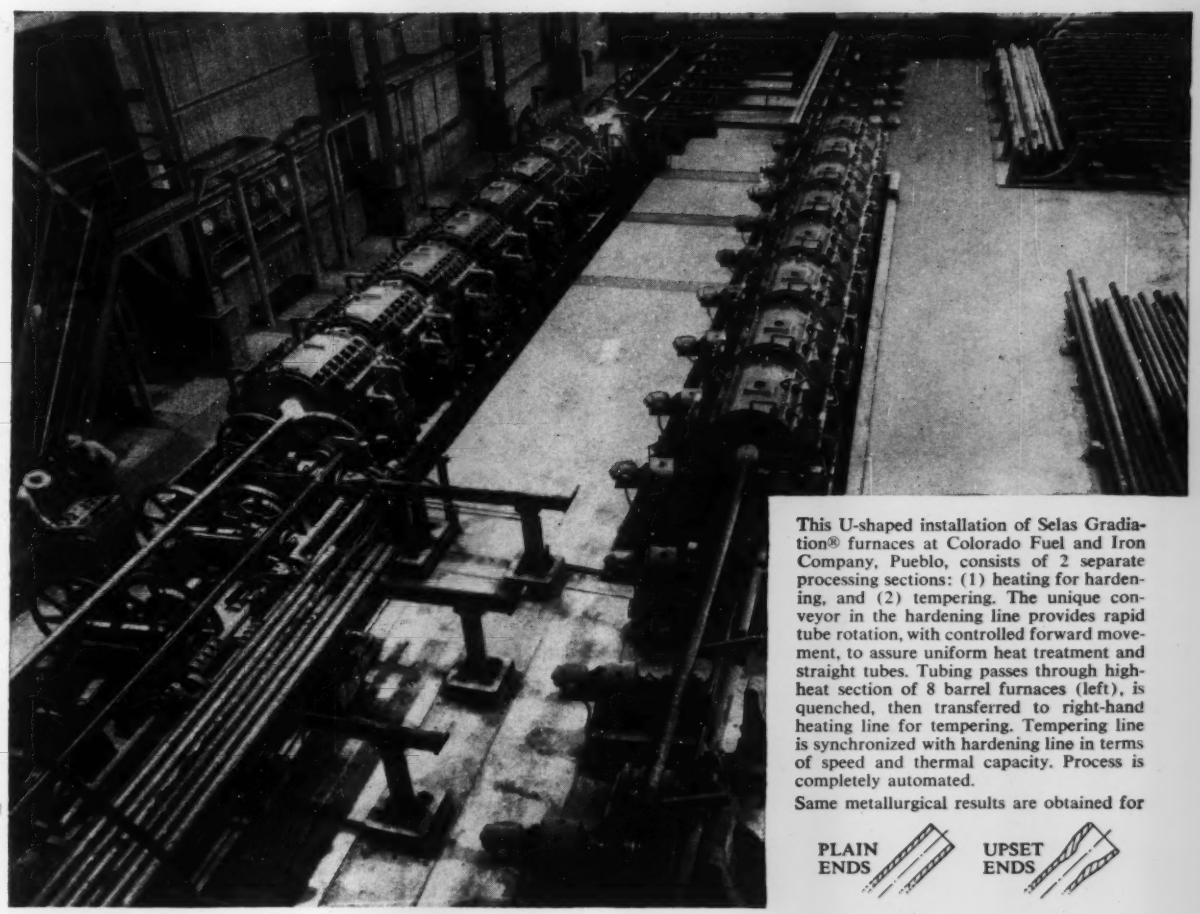
PARKER-KALON stress relieved socket screws

After controlled heating and equally controlled uniform quenching imparting maximum strength, P-K Socket Screws are carefully tempered to assure ductility, proper elongation and high impact strength. This is your assurance that . . . *If it's P-K . . . It's O-K!*

PARKER-KALON DIVISION, General American Transportation Corporation • *Manufacturers of Socket Screws, Self-tapping Screws, Screwnails, Masonry Nails, Wing Nuts and Thumb Screws.*

Sold Everywhere Through Leading Industrial Distributors — Factory: Clifton, New Jersey • Warehouses: Chicago, Illinois; Los Angeles, California

PARKER-KALON® fasteners



This U-shaped installation of Selas Gradiation® furnaces at Colorado Fuel and Iron Company, Pueblo, consists of 2 separate processing sections: (1) heating for hardening, and (2) tempering. The unique conveyor in the hardening line provides rapid tube rotation, with controlled forward movement, to assure uniform heat treatment and straight tubes. Tubing passes through high-heat section of 8 barrel furnaces (left), is quenched, then transferred to right-hand heating line for tempering. Tempering line is synchronized with hardening line in terms of speed and thermal capacity. Process is completely automated.

Same metallurgical results are obtained for

Physical Properties of Deep Well Casing Improved, Uniformity Achieved . . . with Selas Short-cycle Hardening and Tempering

In the heat-treating of carbon and low alloy seamless steel tubing, for a given tensile strength or hardness, Selas short-cycle hardening and tempering develops higher yield strength with no sacrifice in ductility. For with Selas short-cycle heating, a higher tempering temperature can be employed (with no soaking), enabling more complete relief of residual hardening stresses.

Surface carburization is reported to be negligible, scaling is minimized . . . even though no specially-prepared atmosphere is used.

With Selas Gradiation, heating for hardening, quenching and short-cycle tempering of steel tubing are performed continuously, automatically. Consistent metallurgical uniformity is obtained throughout each tube and from tube to tube . . . in both plain and upset ends.

Selas short-cycle heating is used in four of the five lines producing heat-treated oil well casing and Selas barrel furnace lines are widely used throughout the steel industry for annealing as well as hardening and tempering seamless tubes; for heating tubes for sizing; for normalizing welded pipe; for annealing and hardening-and-tempering bars.

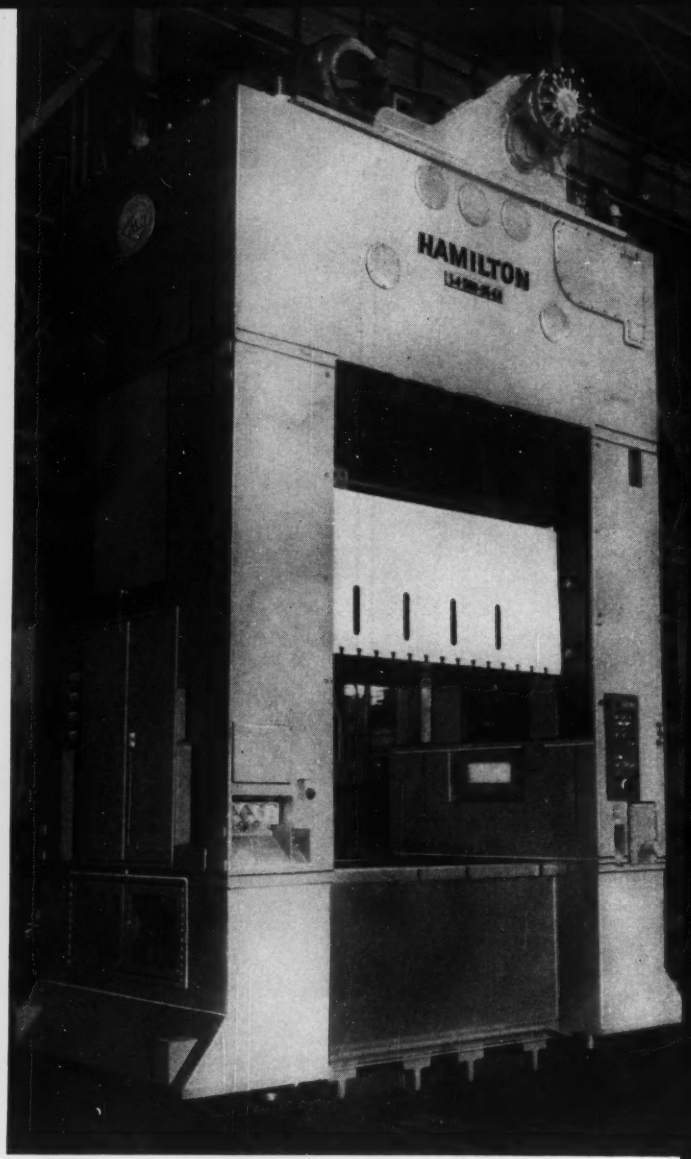
All are continuous, in-line operations. Compact, fast-heating, gas-fired Selas furnaces save valuable floor space, are adaptable to variations in production-line speeds.

Send for informative articles on Selas tube and bar heating installations. Address Dept. 29.

SELAS
CORPORATION OF AMERICA
DRESHER, PENNSYLVANIA

Heat and Fluid Processing Engineers
DEVELOPMENT • DESIGN • CONSTRUCTION

Hamilton 400-ton 2-point eccentric press



Hamilton 500-ton 4-point eccentric press

Hamilton mechanical presses spell the maximum in versatility

No matter what your press requirements are, you probably won't have to incur the extra expense of special designing and "tailor-made" manufacturing if you explore the versatility of the two basic Hamilton press designs pictured above.

The Hamilton 400-ton 2-point eccentric press represents our conventional design, meeting all the basic needs of stamping plants all over the world. And it is so designed that many optional features may be readily added to transform it into a press capable of doing more highly specialized work.

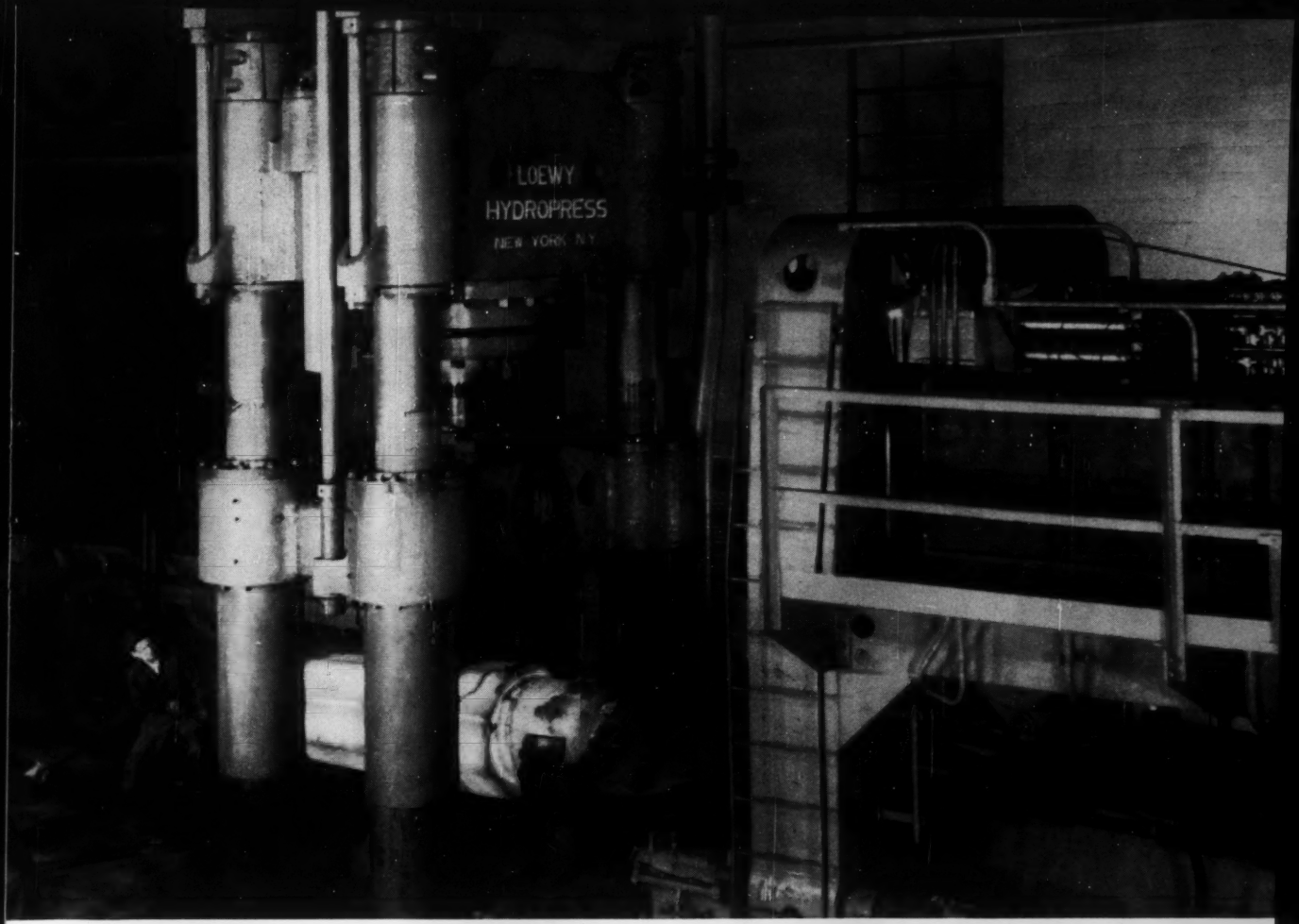
Extra features include automation equipment, air and electric controls and outlets, die lights, die safety blocks, provision for feeds, inbuilding and automatic circulating oil lubrication. These features are built into the 4-point press shown above. Let your Hamilton sales engineer discuss your needs with you.

Hamilton Division Hamilton, Ohio

BALDWIN · LIMA · HAMILTON

Diesel engines • Mechanical and hydraulic presses • Can making machinery • Machine tools

BALDWIN BLH LIMA-HAMILTON



Loewy-Hydropress fast-acting 2000 ton hydraulic forging press in operation at Universal-Cyclops Steel Corporation.

"This fast-acting 2000 ton hydraulic forging press imparts to special steels internal qualities never before achieved"

That's the conclusion of Universal-Cyclops Steel Corporation, a major producer of specialty steels since 1884, as to its Loewy water-hydraulic forging press.

Driven by air-loaded accumulator and equipped with oil-hydraulic effortless servo controls for both normal forging and planishing, this press was designed for extreme eccentric loading and highly economical production—like all Loewy-Hydropress equipment. Note the oversize columns, which have no reduction in area at points of maximum flexure. Due to faster displacement of metal and fewer reheats, Loewy high-speed open forging presses can outproduce hammers in working specialty alloy steels.

Loewy designs and builds open and closed die forging presses, Marform rubber-pad deep drawing presses, extrusion presses, rolling mills, and any other special machinery for hot and cold forming of steel and nonferrous metals. And because Loewy has at its disposal the vast, smoothly integrated facilities of the entire Baldwin-Lima-Hamilton Corporation, you are assured of delivery on time.

For specific information, write Dept. B-8.

Loewy-Hydropress Division

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VANCORAM HIGH CARBON FERROCHROMIUM

Like most economy-minded manufacturers, you've probably turned to oxygen in the melting of your stainless and heat-resisting steels to effect major time, labor and raw materials savings.

That's where Vancoram High Carbon Ferrochromium Alloys come in. They're naturals for added savings when they're put to work with modern-day melting equipment! They give you the most for the least, with no sacrifice in quality.

Get to know these Vancoram Alloys. They're especially adapted for stainless melting, and they are the product of Vanadium Corporation's unceasing efforts to develop better and lower cost high carbon ferrochromium alloys. Your VCA representative will give you the full particulars.

3 POPULAR VANCORAM HIGH CARBON FERROCHROMIUM ALLOYS.

	Chromium	Carbon	Silicon
Standard High Carbon	66/70%	4/6%	2% max.
Ferrochromium "63"	60/65% app.	3.5/5.0%	2/4.5%
Ferrochromium "55"*	50/60%	8% app.	5% max.

*Sulphur .03% max.

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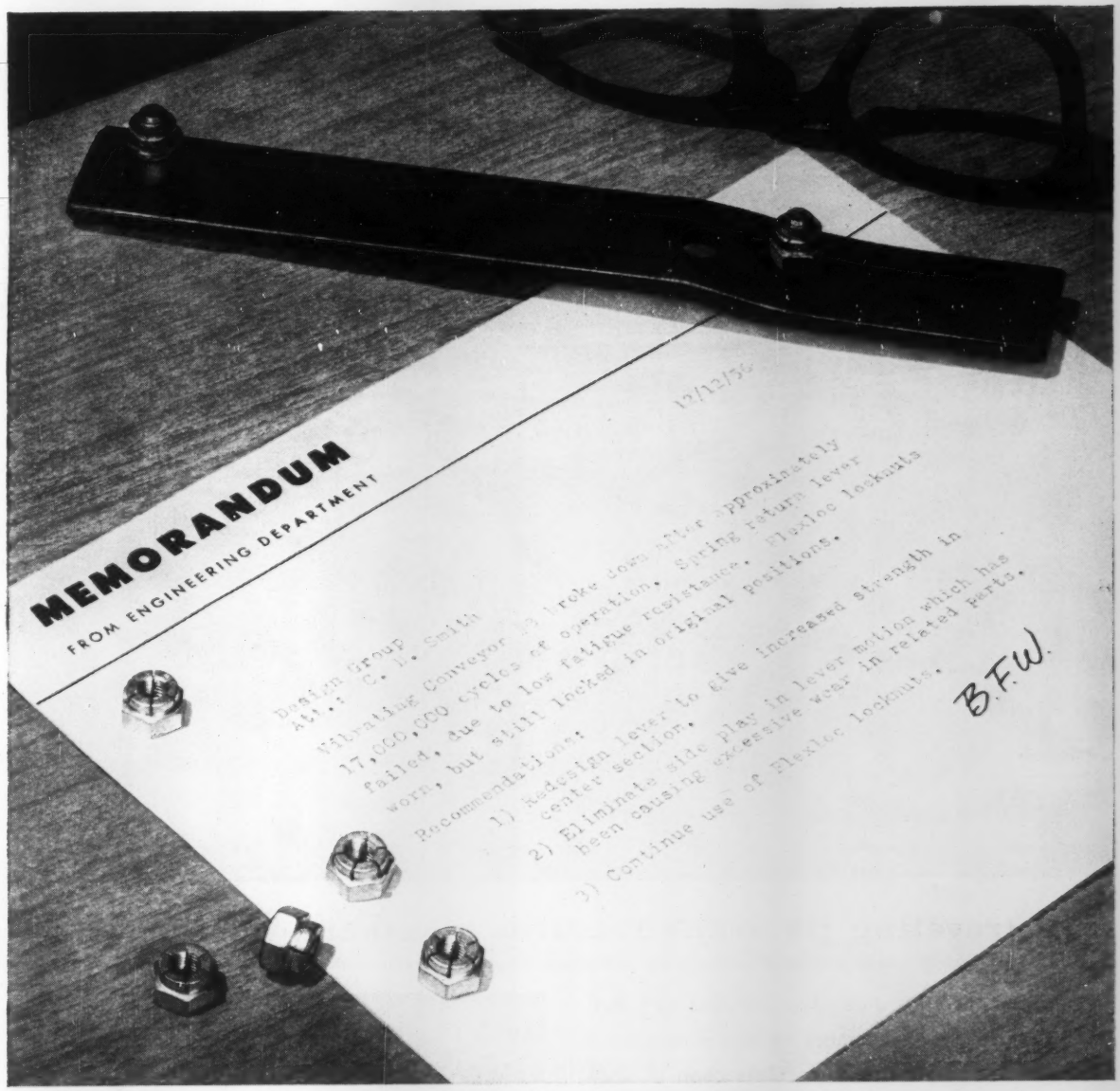
Producers of alloys, metals and chemicals



Why designers specify FLEXLOC self-locking nuts

Where products must be tough . . . must stand up under vibration, shock and abuse . . . designers specify rugged, reliable, precision-built FLEXLOC self-locking nuts as fasteners.

HERE'S WHY:

FLEXLOC locknuts are strong: tensile strengths far exceed accepted standards. They are uniform: carefully manufactured to assure accurate, lasting spring tension in the flexible locking collars. And they are reusable: rough screw threads, repeated removal and replacement, frequent adjustments will not affect their locking life.

Standard FLEXLOC self-locking locknuts are available in a wide range of standard sizes and materials, to meet the most critical locknut requirements. Your authorized industrial distributor stocks them. Write us for complete catalog and technical data. Flexloc Locknut Division, STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.

We also manufacture precision titanium fasteners. Write for free booklet.

FLEXLOC® LOCKNUT DIVISION

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SPS

JENKINTOWN PENNSYLVANIA

14 Industrial Cranes
chosen by largest railroad car shop

wall traveling jib crane features maximum hook coverage

This mammoth railroad car shop installed 14 *Industrial* wall traveling jib cranes to obtain maximum flexibility of operation without obstruction of floor space or interference of overhead cranes. Operating singly or in multiples these *Industrial* cranes easily move along the long runway with assembly line load and in effect give infinite number of jib crane installations depending on requirements.

Consult with Industrial Crane & Hoist for practical answers to your materials handling problems.

3-ton capacity with 30 ft. span Wall Traveling Jib Cranes with Hi-carbon steel boom. Cranes operate on six double flange 12" forged steel wheels rolling on two horizontal and one vertical runway.

Industrial CRANES

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INDUSTRIAL CRANE & HOIST

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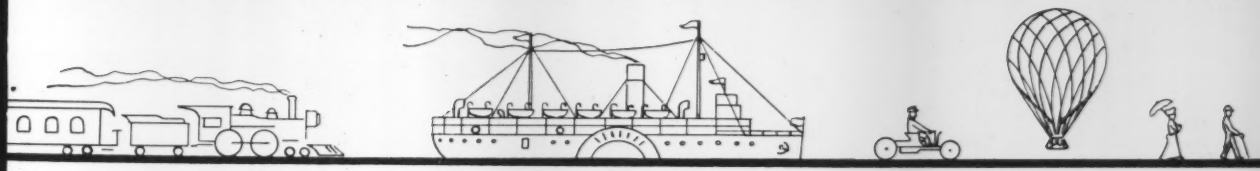
1550 S. PAULINA STREET, CHICAGO 8, ILLINOIS

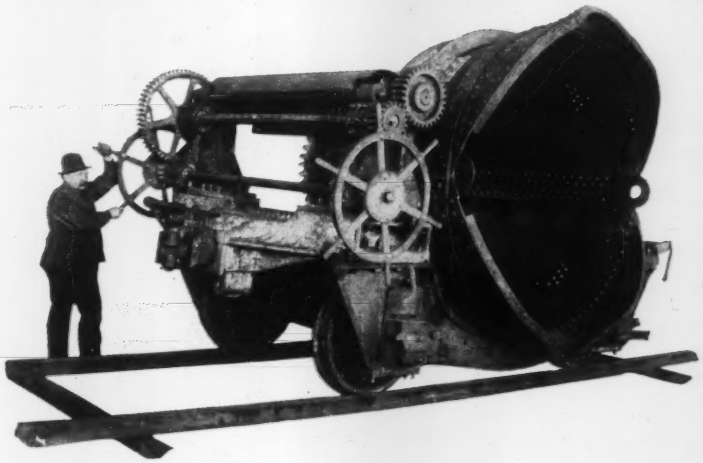
Export Sales: Borg-Warner International, 36 South Wabash Ave., Chicago 3, Illinois

1902 – 25 tons per open hearth heat

1957 – 550 tons per open hearth heat

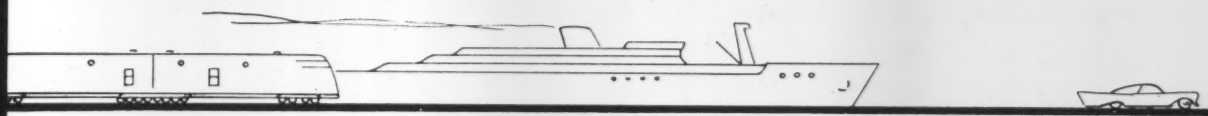
POLLOCK FEEDS HUNGRY OPEN HEARTHS

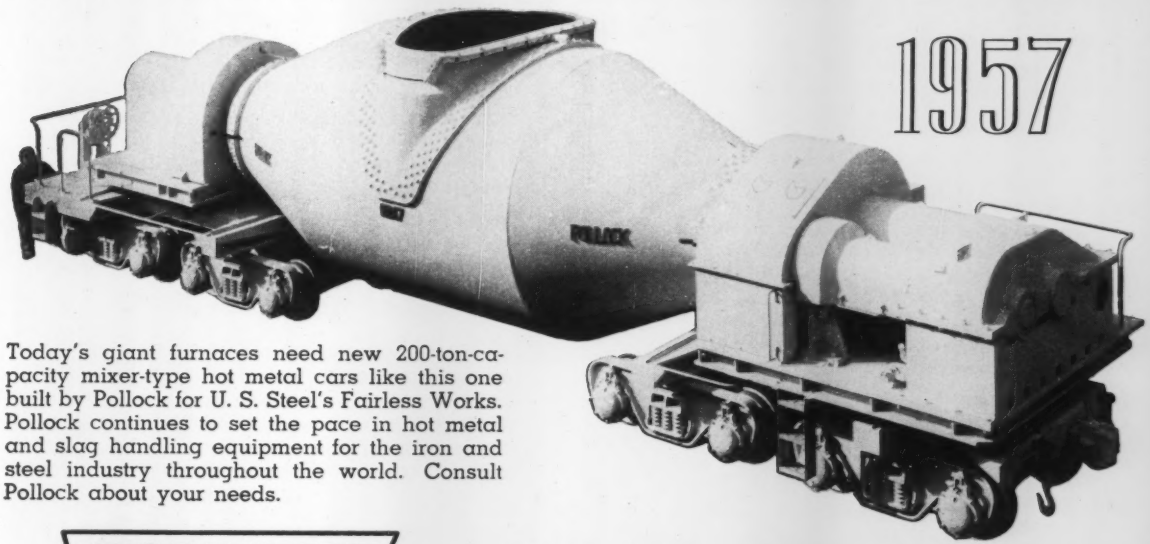




1902

Pigs went to market faster after Pollock designed and built this first 20-ton hot metal car. It was the first of thousands of hot metal cars built by Pollock.





1957

Today's giant furnaces need new 200-ton-capacity mixer-type hot metal cars like this one built by Pollock for U. S. Steel's Fairless Works. Pollock continues to set the pace in hot metal and slag handling equipment for the iron and steel industry throughout the world. Consult Pollock about your needs.

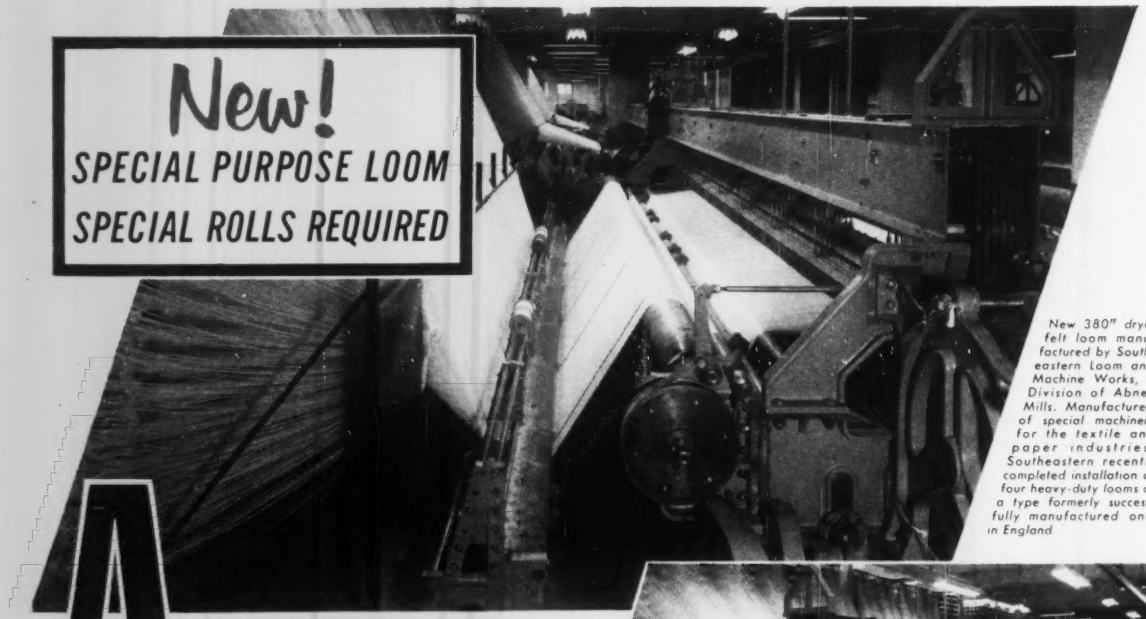
POLLOCK
SINCE 1863

THE WILLIAM B. POLLOCK COMPANY
YOUNGSTOWN, OHIO

STEEL PLATE CONSTRUCTION • ENGINEERS • FABRICATORS • ERECTORS

BLAST FURNACES • HOT METAL CARS AND LADLES • CINDER AND SLAG CARS • INGOT MOULD CARS • CHARGING BOX CARS • WELDED OPEN HEARTH LADLES

New!
SPECIAL PURPOSE LOOM
SPECIAL ROLLS REQUIRED



New 380" dryer felt loom manufactured by Southeastern Loom and Machine Works, a Division of Abney Mills. Manufacturers of special machinery for the textile and paper industries, Southeastern recently completed installation of four heavy-duty looms of a type formerly successfully manufactured only in England

ACIPCO

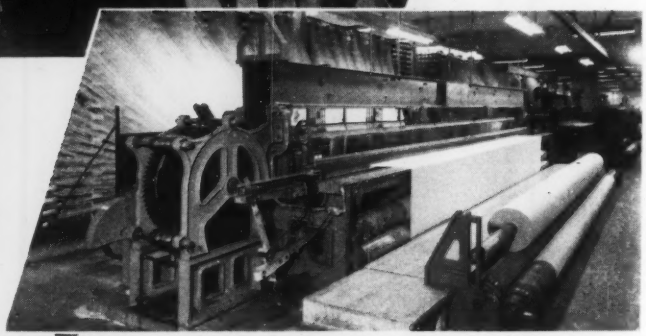
Centrifugally Spun STEEL TUBES

Rolls in this 380" Southeastern loom, designed for weaving thick dryer felts for the paper industry, must stand extremely heavy loading. Minimum roll deflection and run-out are vital to successful operation.

The long length necessary 33'6" imposed a requirement for unusual dynamic balance and dimensional stability in these rolls.

Southeastern Loom and Machine Works, a Division of Abney Mills, selected ACIPCO centrifugally spun steel tubes for the let-off and take-up rolls in this new loom. Because ACIPCO'S centrifugal process produces tubes with *inherent* dynamic balance and dimensional stability, and because they can be produced in the longer lengths now being specified by modern equipment manufacturers, the selection was right from the start.

When function and design set up unusual or difficult requirements for the tubular steel or alloy iron parts in your application, call on ACIPCO. You'll get a combination of expert technical assistance, manufacturing competence and high quality centrifugally spun tubing that produces successful results.



Let-off and take-up rolls in this Southeastern dryer felt loom were fabricated from ACIPCO centrifugally spun tubing. Large rolls are 33'6" long, with 10½" OD and 2½" wall thickness.

VERSATILE ACIPCO CENTRIFUGALLY SPUN STEEL TUBES

are used in the manufacture of calender, engraving, press, slitter, rewinder, plate cylinder, squeeze and starch bath rolls, as well as in hundreds of other industrial applications.

SIZE RANGE: Lengths up to 410" to meet modern machinery requirements have been produced. OD's from 2.25" to 50"; wall thicknesses from .25" to 4".

ANALYSES: All alloy grades in steel and cast iron, including heat and corrosion resistant stainless steel; plain carbon grades and special non-standard analyses.

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Another **STANLEY STEEL STRAPPLICATION*** on the job

"Uni-Tieing" saves this company $13.40 per truck-load!

Rising packaging and shipping costs prompted this New York manufacturer of metal stampings to stop shipping products loose, in crates or in barrels. Switching to the Stanley "Uni-Tie" Method (making many units into *one*, by securing products together or to skids or pallets with Stanley Steel Strapping) cut costs and reduced loading time per truck by 4 hours! Products "Uni-Tied" in this plant are of almost every imaginable size and shape . . . tubular, conical, concave, rectangular, flat with flanged edges, etc. — evidence that "Uni-Tieing" is extremely adaptable.

Learn how the Stanley "Uni-Tie" Method can save time and money for *you. Without obligation,* call in the Stanley Steel Strapping Specialist. WRITE FOR YOUR FREE COPY of the "Stanley Strapplication Manual of Packaging and Shipping" to STANLEY STEEL STRAPPING, Division of The Stanley Works, Dept. H, 1476 Lake Street, New Britain, Conn.

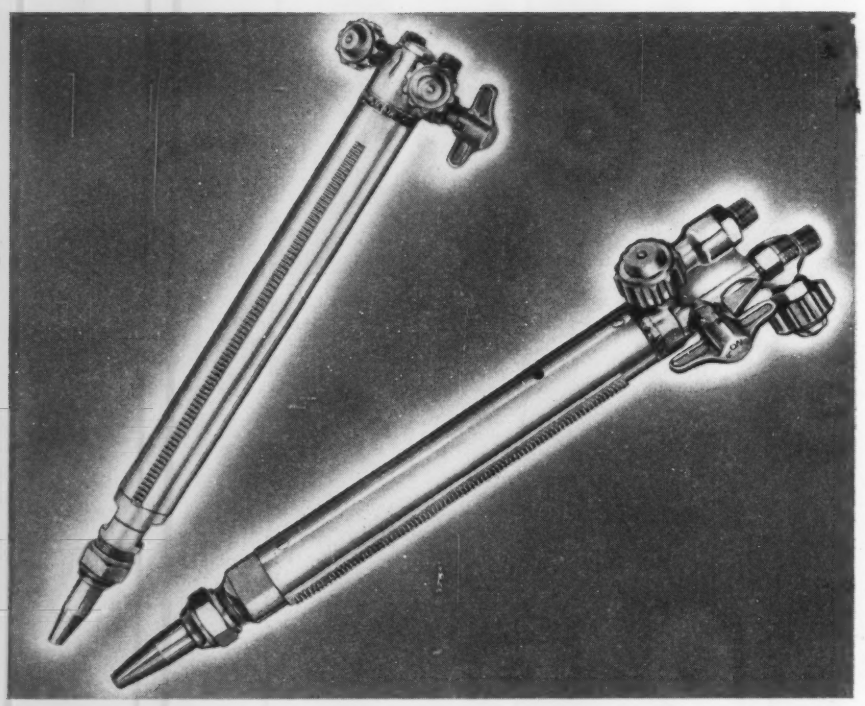
**The system-atic way to solve specific packaging and shipping problems*

INSURE IT-SECURE IT WITH STANLEY STEEL STRAPPING

AMERICA BUILDS BETTER AND LIVES BETTER WITH STANLEY

STANLEY

This famous trademark distinguishes over 20,000 quality products of The Stanley Works—hand and electric tools • drapery, industrial and builders hardware • door controls • aluminum windows • metal parts • coatings • steel and steel strapping—made in 24 Stanley plants in the United States, Canada, England and Germany



NEW

VICTOR

MACHINE CUTTING TORCHES

Two Hose Type

MT-200 SERIES for medium pressure acetylene.

MT-200 LPCG SERIES for low or medium pressure fuel gases such as city, natural or petroleum gases.

Three Hose Type

MT-300A SERIES for medium pressure acetylene.

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Designed for general purpose machine cutting. All commercial fuel gases commonly used for machine cutting can be utilized by selection of the proper size and type of Victor cutting tips and torch model.

These New Victor machine cutting torches feature—

Stainless steel mixing chamber.

Time-tested Victor Spiral Mixer for maximum efficiency and heat resistance.

Convenient control valves for ease of operation.

Popular quick-acting cutting oxygen valve with long life "O" ring packing.

Preheat gas valves with stainless steel ball points and special packing design to hold valve adjustments steady.

For model, type and size best fitted to your needs, call your VICTOR dealer . . . or write us for descriptive bulletins.

VICTOR for welding

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Mfrs. of welding & cutting equipment; hardfacing rods, blasting nozzles; cobalt & tungsten castings; straightline and shape cutting machines.

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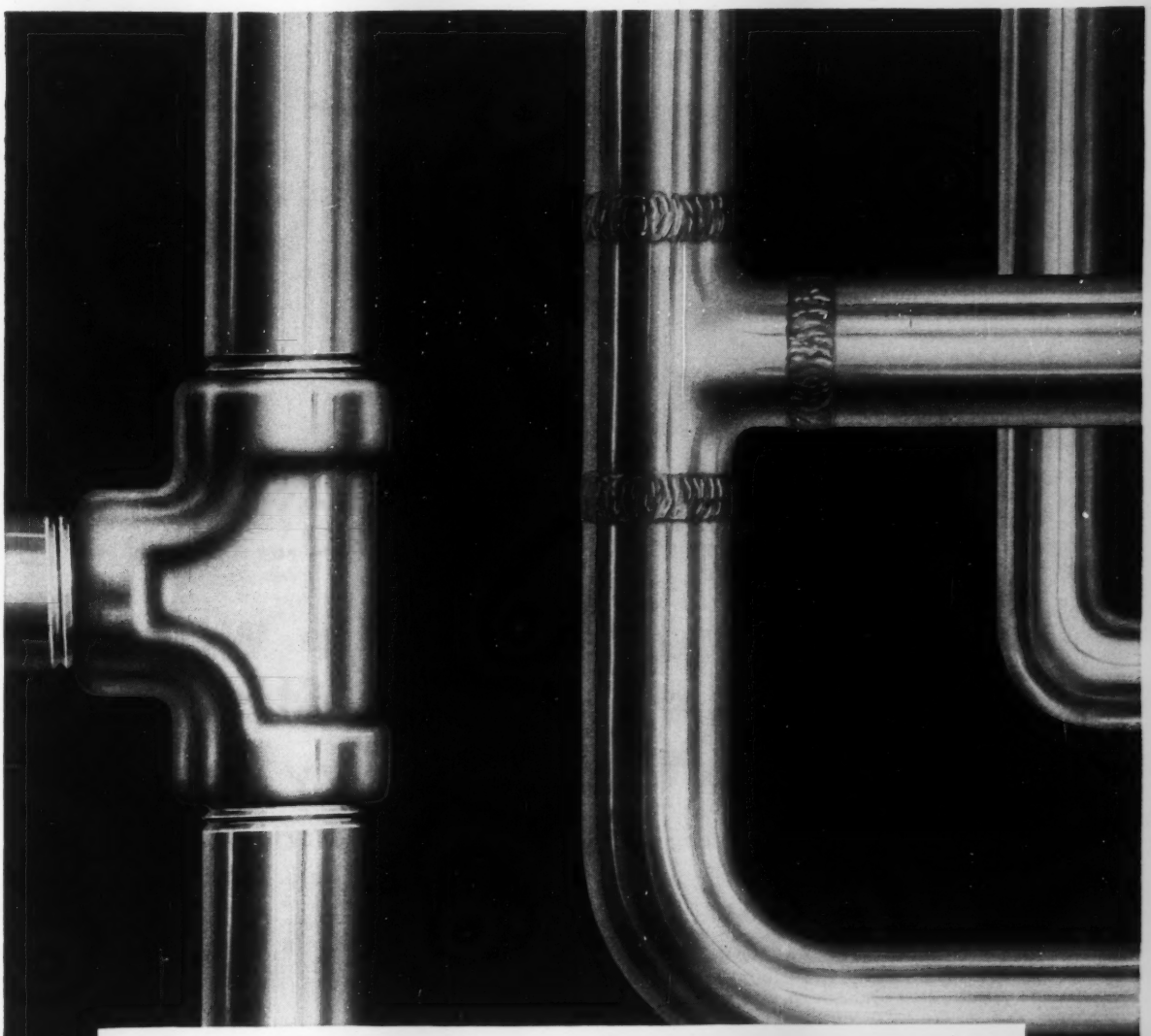

STAINLESS STEEL PIPE

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THE CHEAPEST KIND of DOWN-TIME INSURANCE

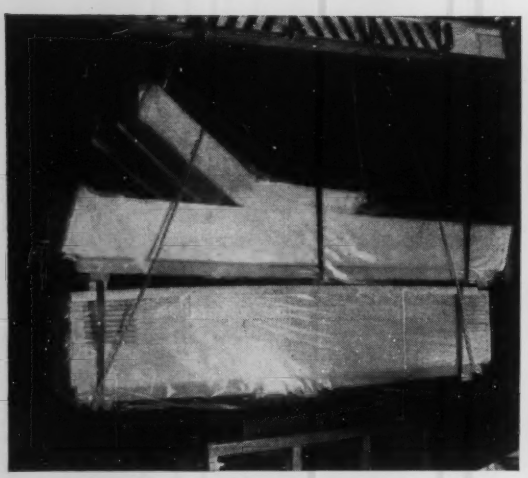
Pennies per foot buys protection from costly down-time. Extremely tough Damascus stainless absorbs bumps and blows without damage. Protects personnel and equipment against danger of sudden leaks. Eliminates the possibility of expensive down-time because of service line failure. Make it a policy always to specify stainless pipe and tubing—a must on high temperature or corrosive applications—a wise investment on any line critical to production.

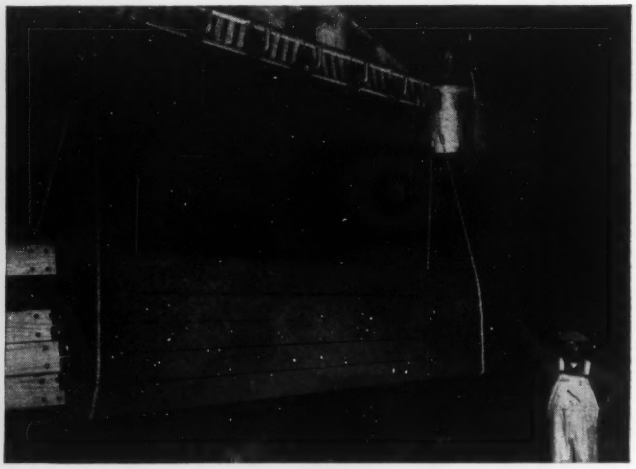
DAMASCUS TUBE COMPANY

STAINLESS STEEL TUBING AND PIPE

GREENVILLE, PENNSYLVANIA

FORMED STEEL TUBE INSTITUTE





BUILDINGS AWEIGH! One of the nation's largest makers of prefabricated steel buildings speeds up production with Tuffy Slings. High flexibility makes Tuffy Slings conform perfectly to irregularly shaped load contours and sharp corners, and snug down smoothly in a choker hitch. Handling and rigging time is cut to the bone. Photographs show heavy loads of steel sheathing panels and steel structural members of prefabricated buildings being handled by Tuffy Slings.

Extra Strength Teams Up With Extra Flexibility in Tuffy® Slings for Fastest Handling of Heavy Loads

How Tuffy Took the Cussedness Out of Slings

Regular-construction wire rope such as the 6x19 or 6x37 will give you the strength you need in sling work. But it makes an ornery kind of sling—stiff to handle, quick to kink and loop, subject to serious damage when bent around small radii and sharp corners.

Tuffy Slings are a different story. They behave beautifully—because they combine the strength of steel with the flexibility of a smooth-flowing fabric. Yet with all this tranquility of disposition, you can't beat Tuffy for taking shock and impact loads.

It's Almost Impossible to Kink a Tuffy Sling. Try it!

With the help of a vise, you might succeed. But you'll find the kink smooths out with hardly a trace of damage. Tuffy's machine-braided fabric won't take a "set" or deformity under the toughest of ordinary working conditions.

Get your FREE Tuffy Sling Handbook

Gives full data on Tuffy Sling types, dimensions, weights and rated loads. Plus a complete rigger's manual and engineer's notebook on wire rope constructions and specifications. Write for your copy now.

Tuffy Pressed-On Ferrule Gives Eye-Splice Full Fabric Strength

Applied under tremendous pressure, the steel ferrule literally flows into every space between wires and strands. The friction force created gives the eye splice 100% of fabric strength. And the streamlined Tuffy ferrule leaves no openings or rough projections to snag or injure hands.

"Double the Service Life of Ordinary Slings..."

That's what one of the nation's big steel corporations reports on the use of Tuffy Slings in their mills. We have a growing stack of similar testimonials from every area of industry where Tuffy Slings and Hoist Lines are used.

Your Tuffy Distributor is a Good Man to Know

He'll help you save money with the longer trouble-free life of Tuffy Slings. He's always ready with what you need—the exact Tuffy Sling or Union Wire Rope for your requirements. He's not only well-stocked for your scheduled-replacement or emergency orders; he's backed by his nearby Union Wire Rope mill depot.

union Wire Rope **corp.**

Specialists in high-carbon wire, wire rope, braided wire fabric, and stress-relieved wire and strand. (5)

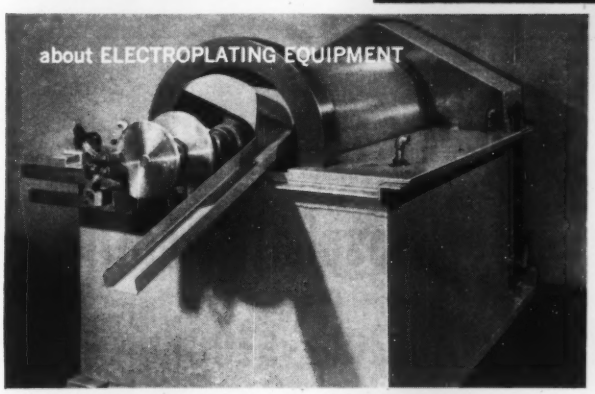
2160 Manchester Avenue **Kansas City 26, Missouri**

from: Metal & Thermit
to: The IDEA Minded

Welding problem solved—production increased

The Blaw-Knox Company, a leading designer and constructor of high pressure, high temperature catalytic reformers for petroleum refining uses special chrome-moly pipe to resist hydrogen attack on furnace tubes at high temperature and to provide desirable creep properties. Welding this alloy had always been difficult. Yet maximum assurance against weld-failure was essential.

Chosen for this difficult job, M&T's Murex® CROLOY electrodes make it easier to obtain high quality welds because maintenance of preheat and postheat temperatures is not critical. These Metal & Thermit electrodes, combined with Blaw-Knox designed unique welding back up equipment, increased productivity of the Blaw-Knox welding crew by a full 50%. They improved weld penetration, eliminated underbead cracking.



A barrel of savings in small parts plating

Chromium plating of small parts is no longer a costly, manhour consuming operation. The unit shown is the new *continuous* Unichrome chromium plating barrel designed by Metal & Thermit. This is a real production tool. It equals 4 batch type barrels in output; plates up to 200 pounds of parts per hour. It brings automation to companies that must chromium plate hundreds of thousands of small parts per day.

Golden-glow bronze finish wins the trophies

Arlen Trophy Company, leading manufacturer of die cast trophies, finds "gold" in the M&T *Golden-Glow* Bronze Plating Process. Cups formerly plated with copper, nickel and gold now get a beautiful-to-behold bronze finish directly on castings. It is the image of 24 kt. gold!

M&T Bronze is also being used in hundreds of installations to replace copper as an undercoat, plating intricate parts more uniformly and twice as fast. It also helps conserve costly nickel.

PLATING MATERIALS
ORGANIC COATINGS
TIN & TIN CHEMICALS
CERAMIC MATERIALS
WELDING SUPPLIES
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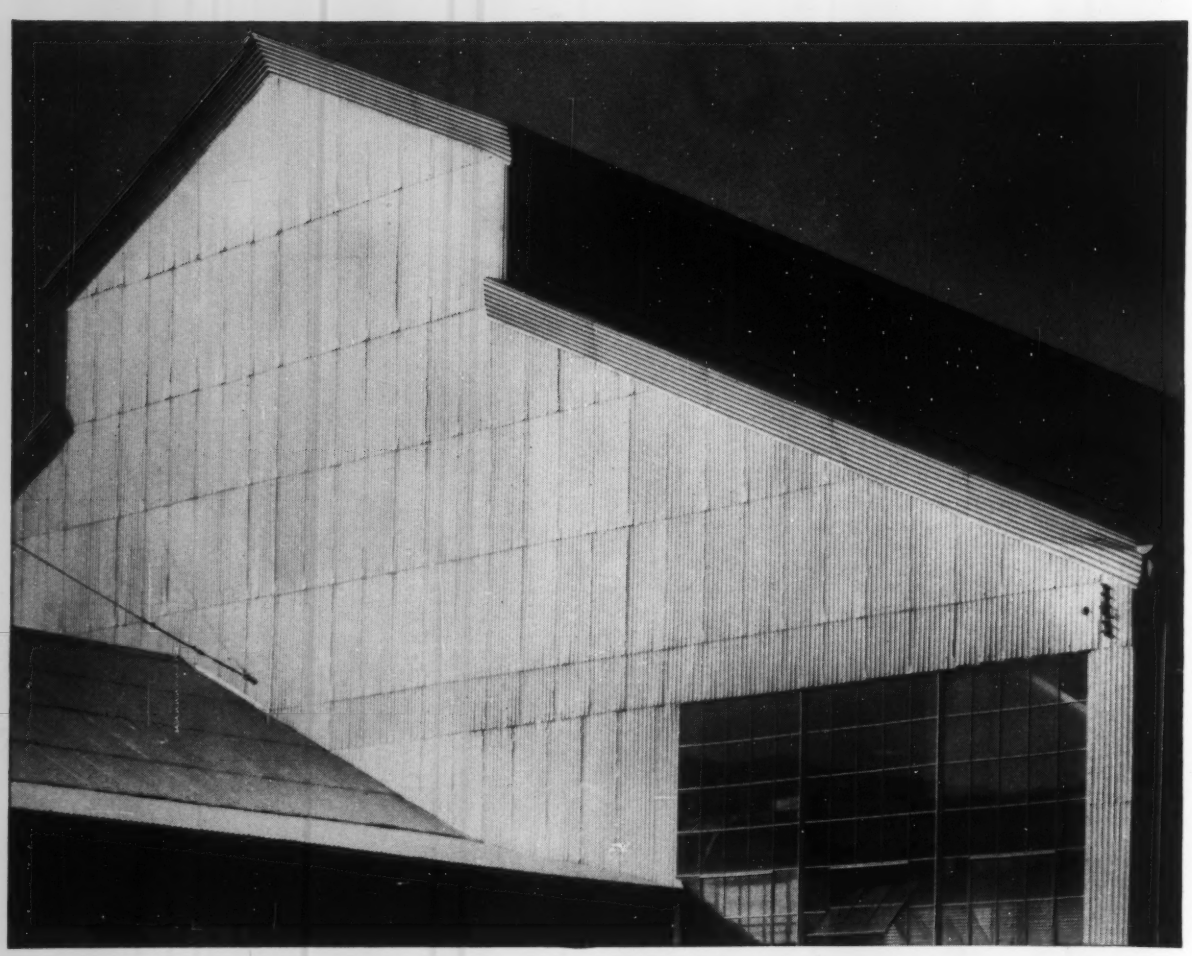
In Canada: Metal & Thermit—United Chromium of Canada, Limited, Rexdale, Ont.



ACP ANNOUNCES A NEW CHEMICAL PROCESS

that develops an excellent zinc phosphate coating on mill passivated galvanized stock

ACP research and development has solved another perplexing problem for its customers in the galvanizing industry—the formation of a good zinc phosphate coating on mill passivated galvanized stock. It offers excellent paint bonding characteristics. The treatment is performed in a 5-stage power spray washer or dip line normally used for coating nonpassivated stock.

If you are having trouble getting a good zinc phosphate coating on your galvanized stock, consult us. We'll be glad to send you descriptive literature or have a technical representative call.

AMERICAN CHEMICAL PAINT COMPANY, Ambler 19, Pa.

CHEMICALS ACP PROCESSES

DETROIT, MICH. • ST. JOSEPH, MO. • NILES, CALIF. • WINDSOR, ONT.

New Chemical Horizons for Industry and Agriculture

For the tough Cold Heading jobs...

KEYSTONE XL WIRE STUDY

Accurate Threaded Fasteners, Inc. looks to KEYSTONE XL WIRE

Unusual and difficult jobs are a challenge to the cold heading division of Accurate Threaded Fasteners, Inc., Chicago, Ill. With their combination of know-how, ingenuity, good machines and Keystone "XL" Wire, they can tackle just about any type of job that comes along—from long production runs to short runs of specials. Shown here are a few examples of their work—in each case the flowability of Keystone "XL" Heading Wire made the job better, faster and cheaper.

And so, another modern wire user learns to depend on Keystone Wire for its exceptional internal and external soundness, accurate size and uniformity of composition and coating.

The list of satisfied customers using Keystone "XL" Wire for both the out-of-the-ordinary jobs, as well as production jobs, keeps growing every day. *Your* name should be included in this list—perhaps for both your cold headed fasteners and parts of your finished products as well.

Check with your Keystone representative for complete details. Our staff of metallurgists and our broad facilities are at your command.

Keystone Steel & Wire Company, Peoria 7, Illinois

KEYSTONE
WIRE FOR INDUSTRY

This fastener was cold headed in an open die. Note that the threads are rolled on, with maximum diameter equal to the rest of the stock. Keystone "XL" flowability was the secret.

This special socket for a spotlight swivel would have involved excessive machining and much material waste. It was cold headed involving a severe upset of 5.5 diameters, and an exceptionally thin-sectioned head. The secret was Keystone "XL" flowability.

This set screw was formed with a blunt point in the double stroke header without machining. The secret was Keystone "XL" Heading Wire flowability.

Keystone Steel & Wire Company
Peoria 7, Illinois

COLD HEADING FACTS FOLDER . . . send coupon today! New folder discusses uses, applications, methods, technical facts, wire requirements.

Name_____ Title_____

Company_____

Street_____

City_____ State_____

Sharp Clean Cuts EVERY TIME

Many thicknesses and sizes of metal are cut on this Steelweld Shear every day. Thanks to Steelweld's exclusive MICRO-SET knife adjustment, it is easy to set the knife clearance to the exact amount which will produce the best cut for every plate run through the machine.

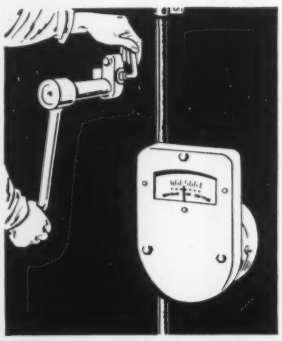
If desired, the knife clearance can be set for an average thickness and all plates cut without changing the clearance. This procedure is used with most shears because to change knife clearance on them is a tedious, difficult operation which usually puts a machine out of service for hours.

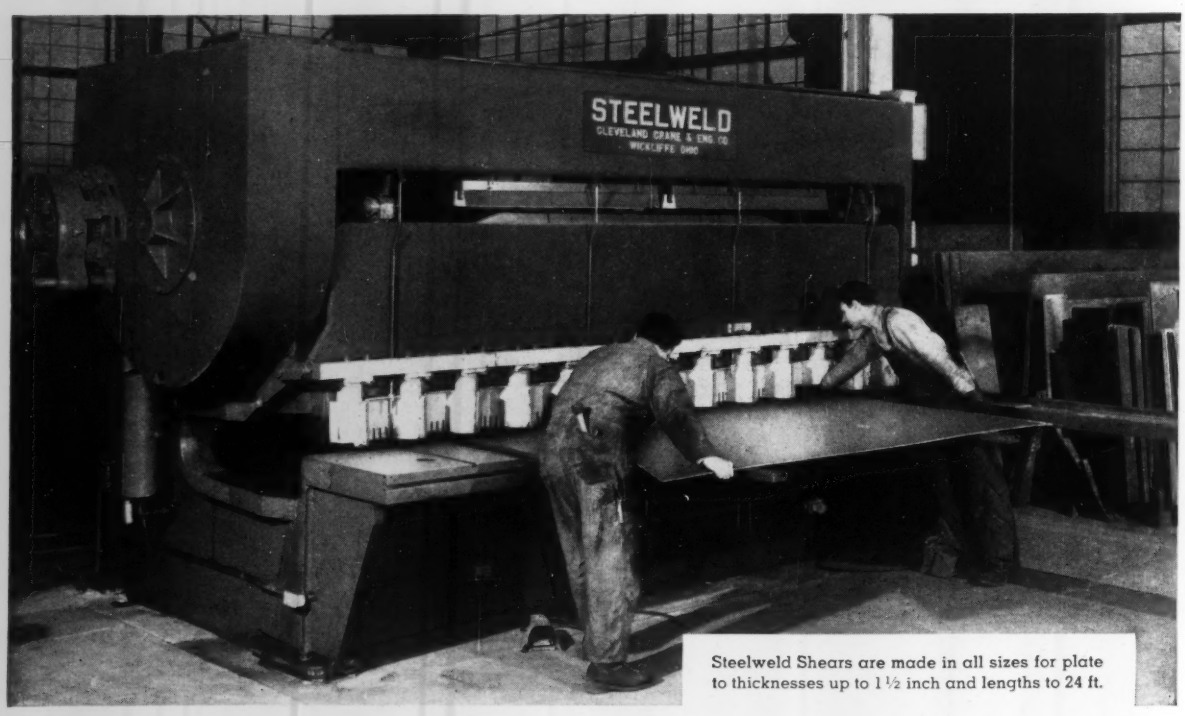
In contrast, knife adjustment on Steelwelds is made in a few seconds. It's simply a matter of turning a crank until an indicator points to the figure representing the thickness of plate being cut. No bolts to loosen; no parts to move. There is no need for using "average" knife settings.

The clutch and brake unit is another outstanding feature of Steelweld Shears. As it is air-operated, it is quick, snappy in action. Its low-inertia design assures cool operation, even after long continuous production runs, because energy to be dissipated is minimized and working pressure necessary on clutch and brake facings is greatly reduced.

The many features of Steelweld Shears make it worth your while to get all the facts.

Because of MICRO-SET Knife Adjustment





Steelweld Shears are made in all sizes for plate to thicknesses up to 1½ inch and lengths to 24 ft.

GET THIS BOOK!

CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

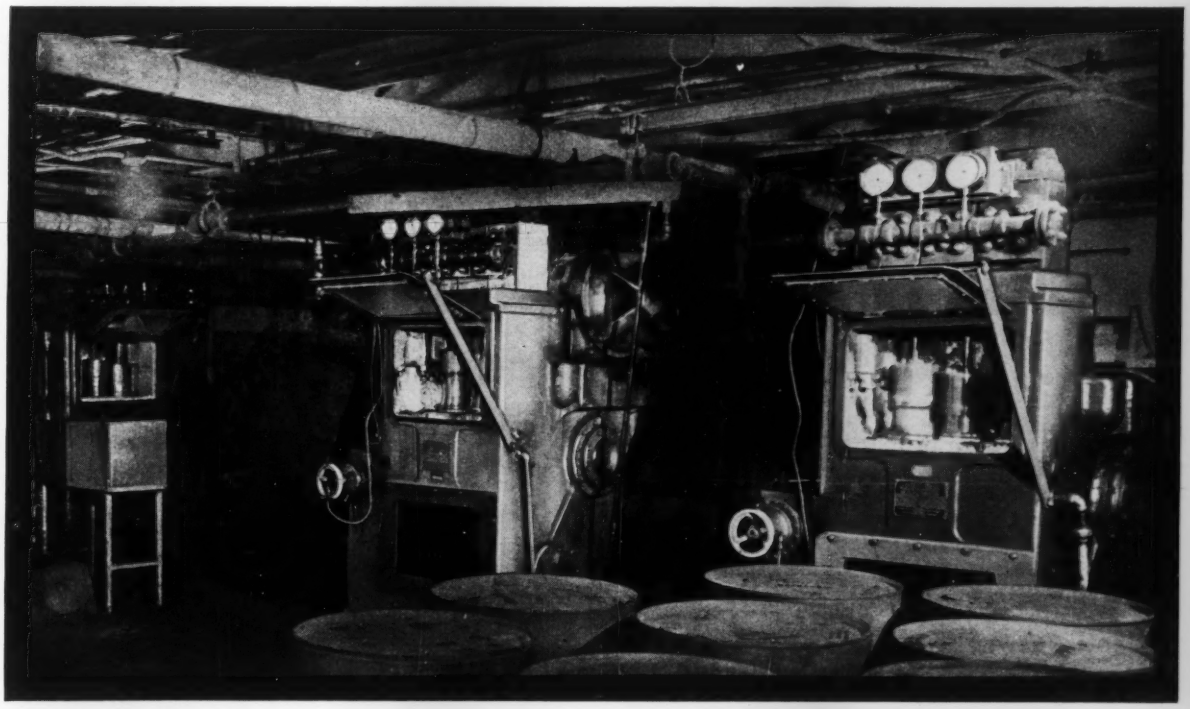
7846 East 282nd Street, Wickliffe, Ohio

STEELWELD PIVOTED BLADE SHEARS

General Cable solves 4-way pumping problem

How to secure maximum rate of production for varying sizes and types of lead sheathed telephone cable posed a 4-way problem for General Cable Corp.

1. Since the maximum extrusion rate for lead through a sheathing die varies for different size cables, hydraulic pumps must have variable capacity characteristics so they can be set for the exact capacity giving maximum rate of production for each cable size.
2. Pumps have to be able to maintain pressures *accurately* at any given point between 4500 and 6000 psi. The pump pressure controls the rate of cable production which is impaired by any variation in pressure.
3. 100% dependability is a must. Any failure of pump or press could result in a break in the sheathing and rejection of an entire reel.
4. Pumps must handle water as a hydraulic medium . . . completely eliminating any fire hazard.



General Cable solved the problem by installing Aldrich-Groff variable stroke pumps . . . the first in 1942, followed by 3 more in 1944, 1948 and 1949. Eleven others were added in various General Cable plants. Aldrich-Groff Pumps provide stepless, straight-line capacity control from zero to rated output. Pump delivery can be adjusted for the maximum rate of extrusion for the size and type of cable being covered and pressures are accurately maintained indefinitely.

Result: Since their installation, these Aldrich-Groff Pumps have more than met the Company's need for accuracy and reliability. They operate continuously, around the clock, six days a week. On one occasion, three of the pumps operated continuously for six months! If you have a pumping problem, we'll be glad to send you full information on Aldrich Pumps and their advantages to you. Write Aldrich Pump Company, 3 Gordon Street, Allentown, Pa.

the toughest pumping problems go to ALDRICH

Pickling Department, Wheatland Tube Company, Wheatland, Pa., producers of quality steel pipe and tubing. Monel alloy tie-rods keep wood tanks tight; acid loss to a minimum.

Third time around for a Monel tie-rod ...and take-up threads still sound!

This man is tightening tie-rods on a pickling tank at the Wheatland Tube Company. They're Monel* nickel-copper alloy tie-rods. Many have outlasted two tanks and are now keeping their *third* tank tight . . . leak-free!

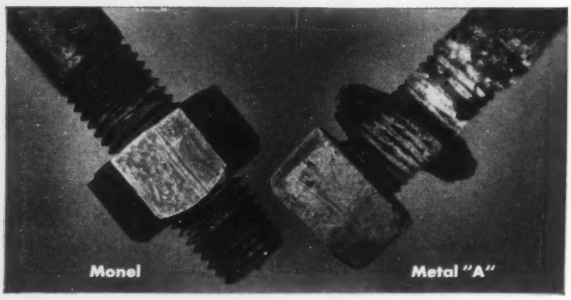
These tanks average four years' service. That means many of these Monel alloy tie-rods have lasted twelve years or more!

You save acid . . . save money when tanks stay tight

You can keep tanks tight with Monel alloy tie-rods. Monel alloy does not dezincify. Take-up threads stay *strong*. All *sound* metal. They hold up under tensions developed by tightening and by swelling timber. You can depend on that!

You can also count on the same dependability from other Monel pickling equipment. Chains, eyebars, pickle pins, and pipe, for example.

And this wrought Monel can be fabricated to any practical design. It's easily welded, too.



Look at this evidence that Monel threads stay sound. When you need take-up thread, you have it, on Monel tie-rods.

* * *

Pickling equipment suggestions available

A 32-page Inco booklet, "Equipping the Pickle House for Greater Production at Lower Cost", tells you how to take advantage of Monel in *your* pickling department. Filled with illustrations and performance information. Write for it today.

*Registered Trademark

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

INCO TRADE MARK **Monel... *for proved pickling life***

Metalworking Outlook

High Temperature Parts Developed

The Air Force reports new materials to withstand extreme temperatures in jet engines. One of the best is a 7 per cent chromium bromide addition to a silver impregnated nickel matrix produced by powder metallurgy. The material will be used for cages of bearings in the engines.

Electrical Firms Spend for Research

Electrical manufacturers of the U. S. are spending about 6 per cent of their sales income on research and development programs, reports Gwilym A. Price, chairman and president of Westinghouse Electric Corp. Those expenditures are equivalent to about one-fifth of all the money spent today by American industry on research and development.

McDonald Denies Irregularities

David J. McDonald denies any irregularities in his campaign and election early this year as president of the United Steelworkers. In a letter to Robert F. Kennedy, chief counsel for the McClellan committee investigating labor, he hints that investigation may be made of the sources for funds of his opponent in the contest, Donald C. Rarick. Mr. McDonald says: "My opponent . . . is alleged to have received a substantial amount of his expenditures from management sources." The union chief insists his funds were gathered from voluntary contributions. An audit of the union's and of the president's personal accounts is being prepared.

Shortage in Supervisors

We face a shortage of supervisors, says Kelly-Read & Co. Inc., Rochester, N. Y., specialist in personnel development. It reports that 25 years ago a supervisor, on the average, was responsible for 15 people. Ten years ago he was responsible for 12. Today, the average is closer to eight people. Industry is at least trying to meet the scarcity. Currently, about 50 per cent of companies in metalworking have an organized program for developing management personnel. In 1953, only 30 per cent of the industry had such programs.

Studies Start on Automation, Jobs

Two agencies are studying the relationship between automation and Michigan's current "unemployment problem." A special Labor Department commission and the Michigan Employment Security Commission will do the job, prompted by the report that 5000 more Michigan workers are without jobs in the Detroit area. The studies will try to learn how many people in Michigan have been made jobless because of automation, what these people are now doing and what type of retraining might be needed for

Technical Outlook—p. 149 Market Outlook—p. 235

OUTLOOK METALWORKI

them to meet the automation challenge. The American Society of Tool Engineers has offered aid.

Nickel Controls To Continue

By 1961, International Nickel Co. of Canada Ltd. will still control about 60 per cent of this country's nickel supplies, guesses Attorney General Herbert Brownell Jr. Its present share is 66 per cent. By 1961, about 450 million lb a year will be available to the U. S. That is "expected to be a sufficient supply," says Mr. Brownell. The implication: Government controls of nickel distribution won't come off until then.

More Gains for LP-Gas

Consumption grows and grows for liquefied petroleum gas. The industry foresees sales of at least 7.5 billion gallons this year, or 300 million gallons more than were predicted for 1960 by market analysts in January, 1956. Nearly 7 billion gallons were used last year. Less than half of the annual LP consumption goes for residential use. Motor fuel usage accounts for 850 million gallons of the 1956 total, while a record 439 million gallons went into rubber components. Chemical manufacturers used 1.6 billion gallons last year, and gas utilities took 234 million gallons. Twenty-six new LP plants were opened last year alone.

Freight Hikes Effective Aug. 26

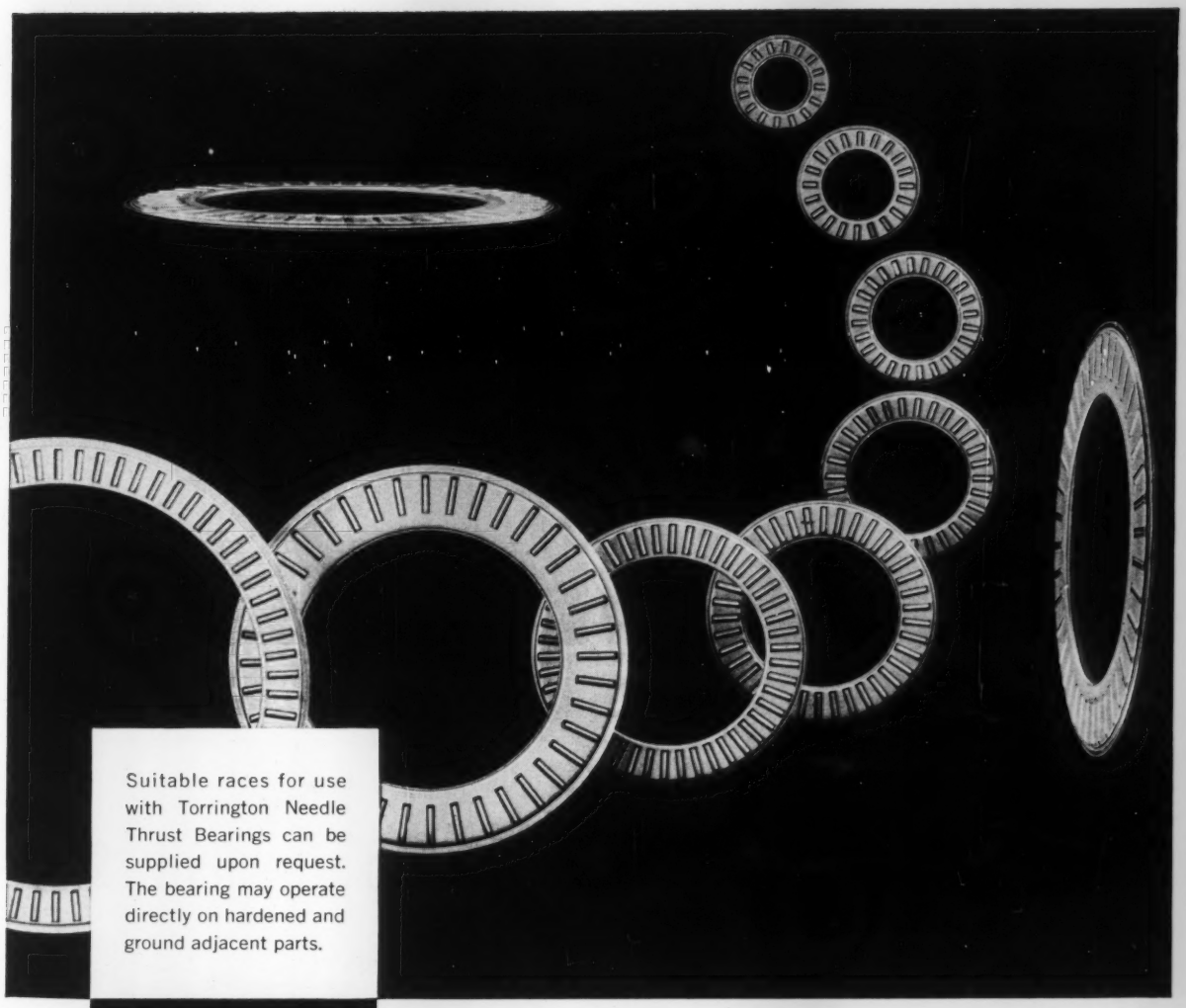
The railroads will put most of the recent freight rate boosts granted by the Interstate Commerce Commission into effect Aug. 26. But southern carriers won't take the boosts allowed on a lengthy list of commodities. Reason: Truck competition. Most of the products that won't get southern increases are in the farm, lumber, and chemical classifications.

Capital Notes

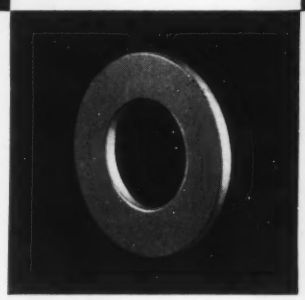
The Senate has voted to make Aug. 22 the deadline for filing requests for fast tax write-offs on facilities to produce liquid oxygen and nitrogen . . . The Urban Renewal Administration authorized $173 million in loan contracts in fiscal 1957, almost triple 1956's rate . . . Aluminum has been removed from the barter list . . . Progress payments on defense contracts have been cut from 75 per cent of total costs, or 90 per cent of direct labor and material costs, to 70 and 85 per cent respectively (small business contracts are excepted).

Straws in the Wind

Bethlehem Steel Co. has been shipping sheet steel from Lackawanna, N. Y., to the Volkswagen auto plant in Germany . . . American industry and commerce are spending some $3 billion a year for material handling equipment . . . The Edsel will use 50 lb of aluminum, says Aluminum Co. of America.



Suitable races for use with Torrington Needle Thrust Bearings can be supplied upon request. The bearing may operate directly on hardened and ground adjacent parts.



Torrington's new Needle Thrust Bearing grows in popularity...and range of sizes

Designers have been quick to take advantage of the compactness, high thrust capacity and low unit cost of Torrington's new Needle Thrust Bearing.

To meet the growing demand for this bearing in automatic transmissions, governors, steering gears, bevel gears, hydraulic pumps, torque converters and many other applications, tooling has been completed to produce bearings ranging from .500" ID to 3.000" ID.

Only .0781" thick, the Torrington Needle Thrust Bearing is thin as an ordinary thrust washer, yet brings all the advantages of anti-friction operation to applications where space is limited. Mating steel retainer halves are joined securely to form a self-contained unit that is easy to handle and install.

Plan today to evaluate the Torrington Needle Thrust Bearing. Services of our Engineering Department are available to help you. For full information, write for Bulletin No. 16, "Torrington Needle Thrust Bearings." *The Torrington Company,* Torrington, Conn.—and South Bend 21, Ind.

TORRINGTON BEARINGS

District Offices and Distributors in Principal Cities of United States and Canada

NEEDLE • SPHERICAL ROLLER • TAPERED ROLLER • CYLINDRICAL ROLLER • BALL • NEEDLE ROLLERS • THRUST

Interlocked corners, curled collars, extruded holes, a severe draw—these operations and many more are represented by these parts for two meter boxes. Armco ZINCGRIP Steel was used for all parts because its tight zinc coating doesn't flake or peel.

Even After Severe Working Parts Stay Zinc-Protected with Armco ZINCGRIP Steel

Its tight zinc coating flows with the steel base during fabrication

A 21-year successful record in manufacturing plants proves that the special zinc coating on Armco ZINCGRIP® Steel withstands working. These severely fabricated meter box parts are good examples.

Despite operations that draw, form, pierce, and extrude this durable steel, the tenacious hot-dip zinc coating continues to protect the base metal—does not flake or peel. There are no zinc-bare spots on these meter boxes when they are placed in service.

Service Proved

A long record of service in hundreds of other manufacturing plants has established this fact: *Anything that can be done with sheet steel can be done with Armco* ZINCGRIP. You don't have to baby it in the shop.

If you would like more information about this special rust-resistant zinc-coated steel for severely fabricated products, just fill in and mail the coupon.

ARMCO STEEL CORPORATION
1927 Curtis Street, Middletown, Ohio
Send me your catalog on Armco ZINCGRIP Steel.

We make_____

Name_____

Firm_____

Street_____

City_____ Zone____ State_____

ARMCO STEEL CORPORATION

1927 CURTIS STREET, MIDDLETOWN, OHIO

Sheffield Steel Division • Armco Drainage & Metal Products, Inc. • The Armco International Corporation

Summer Theater!

Sen. Estes Kefauver (chairman of the Subcommittee on Antitrust & Monopoly of the Senate Committee on the Judiciary) is staging a summer theater presentation in Washington.

But the senator's show is different. The ones we have been enjoying this summer are strictly for fun. His is deadly serious with a hidden motive.

The senator has designated himself the star, as well as production manager. The supporting cast is drafted from industry: Steel, autos, farm equipment, oil, and food processing. The plot is about villainous big business aiding and abetting inflation by unnecessarily raising prices. The audience: You and me.

The setting for the first act is the steel industry. On stage are the star and the top executives of U. S. Steel. The star declares that the steel industry can administer prices because it is highly concentrated; that prices are not the result of inflation but the cause; that large companies make too much money; that U. S. Steel doesn't fight the unions hard enough to keep down wage demands and that the $6 a ton price increase (quoting STEEL) is costing Westinghouse $215 million a year (STEEL said $2.5 million).

Fortunately, the star can write only his own lines, so his statements are quickly refuted by the supporting cast. They point out that:

An administered price is merely an established price at which something is offered for sale and applies to practically everything we buy;

One hundred twelve of 447 American industries are more concentrated than steel (U. S. Steel's share of ingot capacity declined from 35 per cent in 1941 to 29.7 per cent);

U. S. Steel tried to slow down inflation in 1948 by cutting prices $1 to $5 a ton but rescinded the cut three months later when wage-price pressures became too great;

U. S. Steel earned 9.25 cents per dollar of sales in 1940, a figure often exceeded in predepression years, but never equaled since 1940 (the industry earned 7.28 cents per dollar of sales in 1956);

The nation's steel plants have been struck five times in the last 11 years, including five weeks in 1956, in an effort to resist wage-price inflation;

Westinghouse's increased costs couldn't possibly be $215 million (equivalent to 35.8 million tons or 40 per cent of finished steel output).

It becomes immediately obvious that the star's lines are based on erroneous conclusions and inaccurate information. As the show goes on, it also will become increasingly obvious that the star (with his eye on the White House in 1960) is more interested in building a political future than in the economic problems of the day.

Irwin H. Such
EDITOR-IN-CHIEF

We make them all!

• Here are two examples of washers produced in our plant. The one in the tweezer is used in small electric units. The other is used in the assembly of heavy-duty materials handling equipment. And, here's an amazing comparison: It would take more than 12,000,000 of the tiny washers to match the weight of the BIG washer!

This gives you some idea as to the magnitude of washers covered by our inventory comprising over 100,000 dies which are at your service. What's more, you don't pay one red cent for the use of existing dies. Or, special dies can be made in our own plant to fill your specific requirements. *Moreover, you can count on excelled quality and competitive prices from the world's largest producer of washers.*

Since 1887

• Look to Wrought Washer Mfg. Co. as your No. 1 Source for Washers and Stampings . . . enjoy the benefits which leadership offers you. Write for free copy of our Catalog No. 40.

WROUGHT WASHER MANUFACTURING CO.

the world's largest producer of washers

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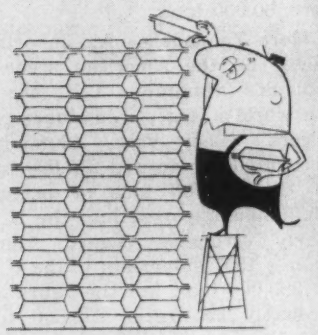
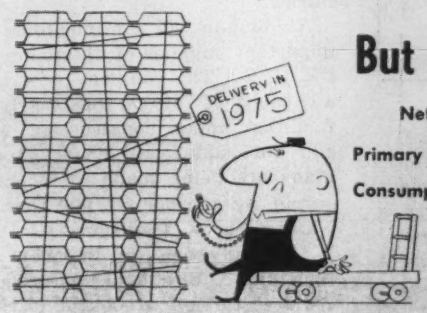


Plenty of Aluminum Now . . .

Net Tons	1956	1957
Primary production up	1,678,954	1,700,000
Domestic availability up*	2,338,954	2,400,000
But consumption down	2,057,000	1,950,000



But More Expansion by 1975

Net Tons	1960	1965	1970	1975
Primary production up	2,420,000	3,000,000	3,800,000	5,200,000
Consumption up more	3,100,000	4,100,000	5,200,000	7,200,000

*Includes primary production, imports and secondary recovery. All figures estimated by STEEL.

Aluminum Looks Ahead

Producers say the key to supply-demand balance is greater market penetration. Forecasts see consumption in 1975 more than 3.5 times greater than in 1957

ALUMINUM is bidding to increase its share of the metalworking market.

Since 1951, primary production has doubled—producers hope to double it again by the late 1960s. But between 1970-75 the real spurt will come. By 1975 primary production may hit an estimated 5.2 million tons yearly, triple present output (see table above).

Status—However, the picture's not quite so rosy today. Primary production in 1956 was 1,679,000 tons. This year's output should reach 1.7 million tons, a 21,000 ton increase over 1956. Add to this estimated secondary recovery and imports and you have a total domestic availability of 2.4 million tons, 61,000 tons more than in 1956.

Yet domestic consumption is expected to drop from 2,057,000 tons to around 1,950,000 tons. This means about 450,000 more tons of aluminum will be available in 1957 than will be consumed.

About 150,000 tons of this will go to the government under "put" right agreements. The remaining 300,000 tons will be added to producers' inventories (100,000 tons went into inventories between Jan. 1 and Apr. 30). A strong fourth quarter pickup could partially reduce inventories, but don't bank on it.

Two other problems: 1. "Put" right agreements will end in 1958 and 1959, throwing more production on the open market. 2. Canadian imports are expected to increase.

Prospects — In spite of these problems, the domestic industry now has about $1 billion earmarked for expansion (see Page 109). Producers expect consumption to reach 3.1 million tons yearly by 1960 and then shoot up to 7.2 million tons by 1975. Their reasoning: 1. A spurt in family formations will take place, especially in the 1970-75 period. 2. Per capita consumption is expected to rise from the present 24 lb to 42 lb by 1975. 3. Expanded uses will continue to take more and more aluminum.

Actually, there's a sign of strength in the 1957 aluminum picture even though consumption is off. Says Aluminum Co. of Amer-

The Whole World Is Expanding

(Primary aluminum production, thousands of tons)

	U. S.	Canada	West Europe	Russia & Satellites	Other*	World Total
1960	2420	1112	880	1052	270	5734
1957	1700	650	725	700	145	3920
1956	1679	638	674	616	106	3713
1955	1566	608	613	531	83	3401

*Japan, Formosa, India, Brazil, Australia, and French Cameroons (beginning in 1957).
Source: Reynolds Metals Co. and STEEL estimates.

ica's president, I. W. Wilson: "Aluminum has been holding its own tonnagewise in the over-all market at a time when unit output of many significant applications, such as housing starts and durable goods, has been at a reduced level."

Many producers even look on the excess tonnage as favorable. "We have to have excess production to talk potential users into switching to aluminum," says Walter F. O'Connell, president of Ormet Corp., New York.

One of the big headaches facing aluminum's management is how to plan additional capacity so there will be enough metal five, ten, or fifteen years from now. (It takes about two years to construct a primary facility.) Complicating the problem is that once production is in, it can't be turned on and off as demand fluctuates. Reason: Technological and cost factors dictate that primary facilities operate at or near 100 per cent of capacity.

Lineup — Today, three major companies account for the bulk of U. S. primary production: Aluminum Co. of America, Pittsburgh, 45 per cent; Reynolds Metals Co., Richmond, Va., 27 per cent; and Kaiser Aluminum & Chemical Co., Oakland, Calif., 25 per cent.

Anaconda Aluminum Co., a subsidiary of the Anaconda Co., New York, is the only other operating primary producer. It has a plant at Columbia Falls, Mont., with a capacity of 60,000 tons a year—a recent production curtailment should hold production to about 55,000 tons in 1957. Currently, 35 per cent of production goes to Anaconda subsidiaries—the rest to independent fabricators.

Anaconda is building a pilot plant to beneficiate raw grade domestic clays to produce a reduction grade alumina. "If this process turns out to be practical, it would make us independent of foreign sources of bauxite," says Mord Lewis, executive vice president. "The wide occurrences of clays in the U. S. make it possible to put a clay treating plant close to almost any reduction facility."

Two other producers are set to make their debut on the American aluminum scene: Harvey Aluminum Co., division of Harvey Machine Co., Los Angeles, and Ormet Corp. Harvey will open its 54,000-ton Oregon reduction plant in 1958. Two-thirds of its production will go to the government and independent fabricators—one third to Harvey Machine.

Ormet Corp., jointly owned by Olin Mathieson Chemical Corp., New York, and Revere Copper & Brass Inc., New York, will begin operating in 1958. Now under construction are a 350,000-ton alumina plant at Burnside, La., and a 180,000-ton reduction plant at Omal, Ohio. Initially, Olin Mathieson will take 120,000 tons yearly for its fabricating facilities; Revere, 60,000 tons.

More Tonnage — An important factor on the American scene is Canada's Aluminium Ltd., one of the world's largest aluminum producers. Last year, Aluminium accounted for around 215,000 tons of the 230,000 tons of primary aluminum imported into the U. S. Early estimates pegged Aluminium's 1957 shipments to the U. S. at 285,000 tons, but the figure will probably be nearer 235,000 tons because of a strike at the company's Arvida, Que., reduction facilities.

Aluminium will continue to be an important supplier of aluminum to the U. S. The company now has a capacity of 762,000 tons yearly—facilities under construction will add an additional 88,000 tons. Plans are being made to increase output by another 182,000 tons.

Overseas — Traditionally, the U. S. has been an importer of aluminum. But domestic producers are starting to look at foreign markets. Kaiser says exports currently account for only 1 per cent of sales. Yet, the company is setting up an overseas division to handle foreign sales and distribution of its products.

Another Factor—This year, secondary recovery of aluminum from all sources should be around 440,000 tons. Secondary producers are confident their growth will keep pace with primary's. Example: American Smelting & Refining Co., New York, is building one of the largest secondary aluminum plants in the world at Alton, Ill. Capacity is pegged at 36,000 tons yearly.

Secondary recovery seems destined to play an increasingly important role on the domestic scene. Since large-scale aluminum uses are relatively new, the industry has never really faced a scrap problem. "But it will be an important factor in 10 to 15 years when obsolescence overcomes a lot of new installations," says one industry executive.

Preview—More primary capacity, greater secondary production, increased imports add up to the $64,000 question: How's all this aluminum going to be consumed?

As Kaiser vice president and

general manager, Donald A. Rhoades, puts it: "Aluminum is still a new metal. The industry has to acquaint not only many fabricators with the range of applications possible with the metal, but also make the general public aware of its qualities."

Point: Though aluminum is now the number two metal, it's still a minor component in most markets. Consensus is the sales problem can be solved by penetrating more deeply the markets where aluminum already has a foothold. Says Richard S. Reynolds Jr., president of Reynolds: "While the total economy is expected to expand in the years ahead, our own studies and industry forecasts indicate the use of aluminum will grow proportionately more than other metals in construction, transportation, packaging, appliances, and electrical."

Construction—This field shows the most promise, say aluminum men. Today, the average home contains 25-30 lb of aluminum—the industry believes this figure can be hiked to 1500-2500 lb (Alcoa has built a model house which contains 7500 lb of aluminum). As Mr. Wilson puts it: "In the years ahead, the demand for new homes to meet the needs of America's growing population will require a substantial increase over the present rate of housing starts."

By 1970, construction will use an estimated 700,000 tons of aluminum annually. Most common uses: Windows, roofs, screens, interiors, plumbing, walls.

Automotive—Auto uses have risen over 200 per cent in the last few years—now average around 40 lb per car for trim, grilles, pistons, etc. One company used 255 lb in its most expensive 1957 model.

Producers see Detroit ordering as much as 300,000 tons of aluminum yearly by 1960. Possibilities: Brake drums, engine blocks, bodies, doors. Rumor has it that one leading car division is actually scrapping its chrome plating equipment in favor of anodizing equipment.

Packaging—Observers say this field could develop into a real bonanza. The greatest sales now are in specialty packaging, where appearance is more important than the added cost of aluminum, and in flexible packaging.

Aluminum has a pretty good toehold in flexible packaging, but its higher cost so far holds up any great penetration into the rigid container field. The potentialities there are great: If aluminum were largely to replace steel, it could mean an added consumption of 2.3 million tons annually.

"Production engineering is the greatest need in the aluminum packaging field," says Eric West,

Aluminum Producers Build

(New facilities announced by U. S. primary producers)

Company	Type Plant	Location	Yearly Capacity (tons)	Cost	Completion Date
Aluminum Co. of America	Reduction	Warrick, Ind.	150,000	$ 80 million	....
Aluminum Co. of America	Reduction	Point Comfort, Tex.	20,000	11 million	1958
Aluminum Co. of America	Reduction	Wenatchee, Wash.	20,000	10 million	1961
Aluminum Co. of America	Alumina	Point Comfort, Tex.	750,000	45 million	1958
Harvey Aluminum Co.	Reduction	The Dallas, Oreg.	54,000	44 million	1958
Ormet Corp.	Alumina	Burnside, La.	350,000	231 million	1958
Ormet Corp.	Reduction	Omal, Ohio	180,000		1958
[1]**Kaiser Alum. & Chem. Corp.**	Alumina	Gramercy, La.	430,000	70 million	1958
Kaiser Alum. & Chem. Corp.	Reduction	Ravenswood, W. Va.	145,000[2]	200 million	1958
Kaiser Alum. & Chem. Corp.	Rolling Mill	Ravenswood, W. Va.	169,000		1958
Reynolds Metals Co.	Alumina	Corpus Christi, Tex.	182,500		1957
Reynolds Metals Co.	Alumina	Corpus Christi, Tex.	182,500		1958
Reynolds Metals Co.	Reduction	Listerhill, Ala.	112,500	285 million	1957
Reynolds Metals Co.	Reduction	Massena, N. Y.	100,000		1959
Reynolds Metals Co.	Rolling Mill	Listerhill, Ala.	180,000		1959

1—Kaiser will spend $180 million this year on new construction and expansion.
2—Will eventually expand to 220,000 tons yearly capacity.

president of Aluminium Ltd. Sales Inc., New York. "The industry has to develop its own production techniques before we can really crack this market."

Railroads — Producers claim three advantages for aluminum freight and passenger cars: 1. Long life. 2. Low maintenance. 3. Light weight (it's said an all-aluminum passenger car can cut the per seat weight from 2300 to 800 lb).

Some all-welded, all-aluminum freight and passenger cars have been built, but most tonnage so far has gone into roofs, doors, and flooring.

One hitch: Railroads wince at the thought of paying more for an aluminum boxcar that might be on rental one-half of the time.

Marine—A few years ago wood dominated the small pleasure craft field. Today, one-third of all outboard motorboats have aluminum hulls.

Producers are wooing shipbuilders. The prime barrier is cost—a steel vessel can be built for about 25 per cent less than an all-aluminum ship. But aluminum men claim these advantages more than outweigh the added cost: Greater availability of aluminum than steel, low maintenance cost, lighter weight, resistance to corrosion.

Other Uses — Appliances and cooking goods will continue to take substantial tonnages. Electric wiring has a bright, long-range potential.

One of aluminum's best future markets defies classification. It's made up of a whole host of low-tonnage items that range from fishing lures to painters' stilts. Some examples: Road signs, aluminum powder metallurgy products, zoo cages, pole line hardware, farm gates (Alcoa reports 10,000 units were sold last year).

Outlook—Output will probably exceed consumption during 1957, 1958, and 1959 even though these will be good volume years for the industry. But by 1960, new uses and a rapidly increasing population should bring about a production-consumption balance.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.

Senator Kefauver and U. S. Steel's Blough clash in . . .

Testy Testimony in Steel

THE KEFAUVER hearings on the steel price increase are going 'round and 'round. Yet, they'll continue because they're good politics.

Sen. Estes Kefauver (D., Tenn.), chairman of the Senate Antitrust & Monopoly Subcommittee, plans to bring in more steel company executives, representatives of at least five steel-consuming industries and United Steelworker officials.

Sample No. 1—For the general tenor of the investigation, here's one exchange between the senator and Roger M. Blough, chairman of U. S. Steel Corp.:

Senator Kefauver: Did you consult with other companies before hiking the prices of U. S. Steel?

Mr. Blough: I believe you know as well as I do that that's illegal.

Senator Kefauver: Talking over certain matters might not be illegal.

Mr. Blough: Well, the answer is I didn't.

Senator Kefauver: How did you know they would all go up in the same amount?

Mr. Blough: If you are asking me why major producers changed their prices on July 1 in the same amount as we changed ours, I think you should direct your question to the major producers.

Sample No. 2—In another part of the questioning of Mr. Blough, the senator quoted from several periodicals. One from STEEL caused the lengthiest debate. He quoted this publication as saying the steel price hike would mean an increase of $215 million in Westinghouse Electric Corp.'s steel costs. STEEL (July 15, Page 53) actually stated that Westinghouse costs would rise $2.5 million. The senator corrected his misstatement and apologized later.

In the battle of words at the hearings, the Kefauver committee seems to be making ten charges against U. S. Steel and the steel industry.

1. Administered prices are responsible for inflation.

Answer: Mr. Blough quoted Dr. Gardiner Means, the economist who invented the term "administered price": Administered prices lead "to greater efficiency and higher standards of living . . . They are

an essential part of our modern economy . . ."

2. The steel industry can administer its prices because it is highly concentrated.

Answer: Commerce Department figures, said Mr. Blough, show that one-fourth of the industries in America are more concentrated than steel.

3. Price rises cause inflation.

Answer: It would be as logical to say wet streets cause rain, claimed Mr. Blough. Price rises result from, don't cause, inflation. Since 1951, commodity prices have advanced 2 per cent, while the price of services jumped 21 per cent. The U. S. Steel chairman quoted Prof. Richard Ruggles, an economist who has appeared before the subcommittee: "It is not possible to maintain . . . that administered prices have been primarily responsible for the inflationary spiral."

4. Steel price rises push up the cost-of-living index.

Answer: The recent $6-a-ton rise in steel will cost the American consumer with an income of $5000 a year less than 1 cent a day, Mr. Blough said. He quoted Dr. Ewan Clague, commissioner of labor statistics: A rise in steel prices has only a "negligible" effect upon the cost-of-living index.

5. If steel prices were lower, the cost-of-living index would drop.

Answer: Mr. Blough reminded the subcommittee of U. S. Steel's experiment in 1948, when it cut steel prices an average $1.25 a ton. "We might as well have tried to stop an express train (inflation) with a pea shooter."

6. Steel is priced too high.

Answer: Steel at 7.75 cents a pound is a "modern industrial miracle," said Mr. Blough. While it has increased 4.75 cents a pound since 1940, other commodities have risen much more. A rise of 0.3 cent (the July boost) should not be a matter of "grave national concern."

7. U. S. Steel Corp. has inadequate competition.

Answer: For the first time, U. S. Steel's share of the steel capacity in this country has fallen below 30 per cent.

8. The largest manufacturers make too much profit.

Answer: Mr. Blough pointed out that the 500 largest manufacturers increased profits, as a group, 2.5 per cent from 1955 to 1956. All other industrial corporations boosted profits, as a group, 20 per cent. Among the 500, U. S. Steel ranks fourth in sales, but 123rd in profits as a percentage of sales.

9. U. S. Steel doesn't fight the unions hard enough to hold down wage demands.

Answer: The corporation (and the industry) has had five strikes in the last 11 years.

10. U. S. Steel doesn't meet its responsibilities to the nation.

Answer: The average U. S. Steel stockholder has an annual income of less than $4500. The corporation must meet that responsibility. It cannot subtract from stockholders' incomes to add to workers' incomes, said Mr. Blough. Other responsibilities it fulfills: Research for new materials, development of new iron ore reserves, maintenance of steel capacity for war.

What's Competition? — The weight of Mr. Blough's testimony: Similar prices of steel are more competitive than varying prices. If a customer can choose between two companies with the same price, then he has a greater choice than choosing between two makers with different prices. Reverting to the question of U. S. Steel's price leadership, Mr. Blough commented: "There is no company among the first 20 in the industry which couldn't require us to change our price overnight by lowering its price."

His Basic Argument: Rising costs "justified a $9 or $10 increase," but the corporation absorbed part of the 8.8 per cent hike in employment expenses (and in other costs, such as freight rates) and boosted its quotations only $6.

SBA Loans Mount High

During May, the Small Business Administration approved 377 business loans ($16,876,000) and 145 disaster loans ($1.24 million), Administrator Wendell B. Barnes reports.

The total is $4 million over last May's. After ten months, fiscal 1957 loans are almost twice the amount of those approved in the same period of fiscal 1956 ($145 million vs. $67 million).

Radio Net for NATO

Network of microwaves will be reflected around the earth for the defense of Western Europe

MICROWAVE radio communications will soon link certain NATO installations ranging from eastern Turkey to northern Norway.

It means that highly efficient frequencies, almost staticproof, will replace standard long waves that follow the earth's curvature but are highly susceptible to static and can be easily jammed.

Contracts — SHAPE (Supreme Headquarters Allied Powers Europe) has contracted with Hycon Eastern Inc., Cambridge, Mass., and International Standard Electrical Corp., subsidiary of International Telephone & Telegraph Corp., New York, for the $9 million system.

For many years, high frequency radio waves could be used for short distances only because they go in a straight line and stream out into space.

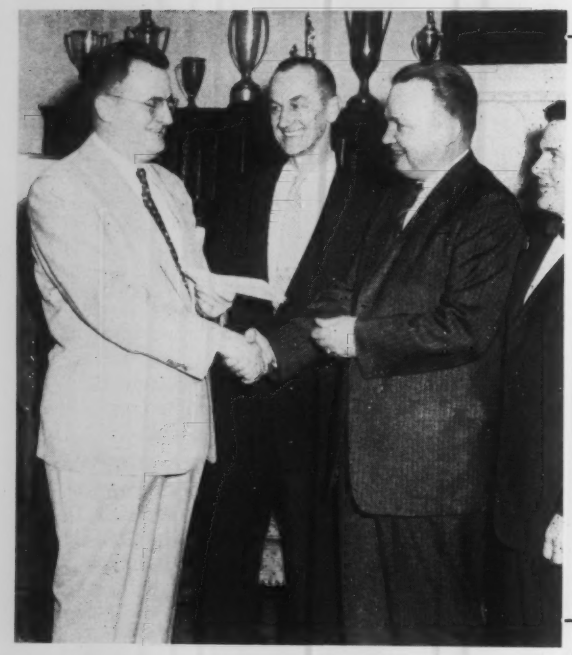
Bounce — Hycon has developed what it calls tropospheric forward scatter radio transmission. It bounces straight line waves against the troposphere (the envelope of atmosphere immediately surrounding the earth), so that they return to the earth at a predetermined spot.

The technique will be used in the NATO communications network under construction. General supervision, planning and engineering of the project will be done in Paris. Field teams will operate in the many countries where forward scatter relay stations will be located.

Cosmopolitan—Technical personnel will be drawn from the NATO nations. Hycon says equipment will be procured "to the maximum practicable extent" on the basis of international competitive bidding.

Highly refined equipment of advanced design is necessary to produce the power needed to send and to receive with the forward scatter method.

Similar systems are operating in Alaska and for the Northeast Air Command of the U. S. Air Force.



Airmatic Valve's president, Lawrence H. Gardner (left), awards prizes to top salesmen of 1956

Memo to Contest Sponsors:

New insight into its market coverage was an unexpected bonus for Airmatic Valve Inc., Cleveland, when the company sponsored a sales contest.

Airmatic's requirements for a successful contest:

1. Make the prizes sensational—give an auto, a Mediterranean cruise.
2. Have something doing every month. Award smaller prizes to winners of monthly contests.
3. Tell salesmen's wives about the contest. Enlist their support.
4. Issue frequent reports on contestants' standings.
5. Make it fair. Let the degree of market exploitation be your criterion, rather than dollar volume of sales.

Sales Contest Sells Valves

IF YOU have direct control of only 3 per cent of your sales force, how can you reach your sales goals?

If your success depends almost entirely upon the efforts of manufacturers' agents—many of whom have bulging portfolios—how can you get attention for your product?

Lawrence H. Gardner, Cleveland valve manufacturer, wanted to know—for those were his problems. With the help of Henry J. Kondrat, a business consultant, he found an answer: Apply consumer sales techniques to the distribution of industrial goods.

Uses Contest—In February, 1956, Mr. Gardner announced a year-long sales contest. His firm, Airmatic Valve Inc., would award $10,000 in prizes to the five men who made the most of their sales opportunities. To give every representative the same chance of winning, Mr. Gardner evaluated the sales potential of each man's territory, using STEEL's "Metalworking Markets in the U. S." as a guide. Salesmen working the lush Chicago area would receive one contest point for each sales dollar; those beating the cactus of the Southwest would get nine points for the dollar.

Contest points were also awarded salesmen for prompt action on customer inquiries. Whenever Airmatic's advertising brought a request for additional information, it was forwarded to a salesman with instructions to call on the prospect at once, interview him, and file a report on his needs. By returning a customer questionnaire to the company within two weeks of receipt, a salesman could earn 50 points; for action within 30 days, he got 25.

Maintains Interest — To keep sales activity at a high pitch, Airmatic awarded monthly prizes (electric shavers, outdoor furniture, cashmere overcoats, portable television sets) to the three men who reported best sales of the "product of the month." To give its program cohesiveness, the company sent out semimonthly bulletins in which it gave sales advice and announced contest standings.

Not content with merely rallying its sales force, Airmatic took steps to enlist the salesmen's wives. It sent them questionnaires, asking about the children in the family, their ages, their birthdays, the size of clothing the husband wore—and telling a little bit about the prizes to be won. Enclosed was a crisp $5 bill. "It was probably the best investment we made," says Mr. Kondrat, "since it caused the wife to ask time and again how her husband was doing."

Gets Results—On Feb. 1, Airmatic's president awarded these prizes to his top five salesmen: 1. A 1957 Chevrolet. 2. A trip to Miami Beach for two. 3. A 21-in. color console television set. 4. A silver blue mink stole. 5. A major appliance of the winner's choice. For his $10,000 investment, he had this much to show: A sales increase in 1956 of 56.75 per cent

over 1955, compared with an average gain of about 27 per cent for the industry. Cost of the contest was no more than 6 per cent of the business gained.

No less important than the sales gains chalked up during the contest were the marketing facts revealed through its operation, Mr. Kondrat declared. The company learned, for example, that some of the agencies it had long considered "good" were far behind their territories' potential. It found that 30 per cent of the agencies were producing 85 per cent of the business. It discovered that in some seven-man agencies, two men were bringing in all of the orders; and in analyzing sales of the two producers, it found that 80 per cent of the business frequently came from one or two accounts. Obviously, the company wasn't getting coverage from the men who were giving it volume.

New Goals—This year, Airmatic is trying to correct deficiencies that last year's contest revealed. It's striving for additional representation in some areas and for better coverage in areas where volume has been good. To improve the quality of its representation, the company brings salesmen to Cleveland for one-week factory training sessions, showing them how it manufactures its products: Hand, foot, cam, solenoid, and remotely operated valves for controlling air, oil, water, chemicals, and vacuums.

Once again Airmatic is sponsoring a contest—this time with the emphasis on new business. There will be twice as many winners in 1957, although the contest appropriation remains the same. This year's prize list: 1. A ten-day Mediterranean cruise for two. 2. A 21-in. color console television set. 3. An auto air conditioner (installed). 4. A 21-in. color table model television set. 5. A 16-mm camera and sound projector. 6. Two 1-ton air conditioners. 7. Winner's choice of a major appliance. 8. A suit and overcoat. 9. A seven-piece set of luggage. 10. A diamond fraternal ring.

For the first six months of 1957, the company is 23.5 per cent ahead of last year's sales. Valve industry sales are down about 10 per cent.

Steelmakers Expand

Both Republic Steel Corp. and Inland Steel Co. will build new plants in Indiana

A NEW sintering plant at Inland Steel Co.'s Indiana Harbor Works will raise the company's annual ironmaking capacity by 300,000 tons. It will supply six of the firm's eight blast furnaces.

The plant is part of Inland's $280-million, three-year expansion program scheduled to lift the company's steelmaking capacity 15 per cent by the end of 1958.

To be built by the Dwight-Lloyd Div. of McDowell Co., the plant will occupy part of a 20-acre property extension created by filling in Lake Michigan. Upon completion, sintered ore capacity will be 4000 tons daily.

Republic Builds—Republic Steel Corp. will construct a new plant at Hammond, Ind., to make riveted corrugated metal drainage products.

The facilities, to be operated by Republic's Culvert Div., will consist of a fabricating plant, an asphalt dip building and administrative offices.

Upon completion, about Mar. 1, 1958, the plant will employ less than 50 persons. Ernest R. Johnson, Republic's vice president in charge of operations, stated that the Hammond site was chosen for its proximity to midwestern drainage products markets.

New Rail Welder Speeds Work

A Swiss-designed, automatic flash butt rail welder, said to make 15 joints an hour, will be made in this country by National Cylinder Gas Co., Chicago. The firm says that it has obtained exclusive manufacturing rights.

The welder is almost three times faster than conventional methods. Costs are about half those of conventional unwelded joints.

Its Operation—The welder applies maximum current for a minimum time to steel rail ends which are fitted firmly together in the machine. Welding heat is followed by a 60-ton impact or upsetting pressure that squeezes molten metal out of the welding zone. It provides a high quality weld without subsequent annealing.

About 4 minutes are needed to put rail sections into the machine, weld them and shear off welding flash.

Galvanizing Plant To Open

Anchor Metals Inc., Hurst, Tex., will open a fabrication and galvanizing plant for electrical transmission towers and switchyard structures in Ft. Madison, Iowa.

Fort Madison Div., Anchor Metals Inc., will open about Nov. 1 with a $2 million backlog. At normal operation, expected by Feb. 1, 1958, the plant will employ 100.

The plant represents a $1 million investment (80 per cent by Anchor and 20 per cent by Boyles Galvanizing Co., Hurst, Tex.).

Stairway Plant Ready

Westinghouse Electric Corp. completed its 250,000 sq-ft electric stairway plant near Dover, N. J. The plant is part of a $75 million expansion Westinghouse had planned for 1957.

Barium Steel Adds Oxygen Plant

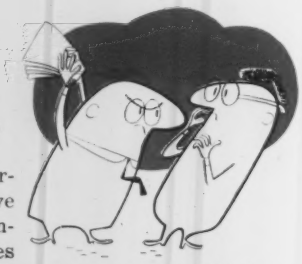
Phoenix Iron & Steel Co., Phoenixville, Pa., a subsidiary of Barium Steel Corp., will install a new $500,000 oxygen producing facility at its Phoenixville plant.

The plant, scheduled for operation by next spring, will have a monthly capacity of 7.5 million cu ft. The oxygen will be used for scarfing pipe mill ingots, for fabricating applications in the Phoenix Bridge Co. (a subsidiary of Barium Steel Corp.), and for open hearth operations.

Plans Aluminum Rolling Mill

Aluminum Goods Mfg. Co., Manitowoc, Wis., will build a $12-million rolling mill. Construction of the 157,000 sq-ft structure is expected to take about two years with mill operations starting about 1960. Capacity of the mill will be 60 million lb annually. Facilities will be installed to produce most of the firm's sheet needs, including some of the harder aluminum alloys. Effective Jan. 1, 1958, the name of the company will be changed to Mirro Mfg. Co.

Economist Disputes Kefauver's Theories



THE KEFAUVER hearings on steel prices have degenerated into a personal vehicle for Sen. Estes Kefauver (D., Tenn), designed to get his 1960 campaign into gear. One proof: He's blocking attempts by U. S. Steel Corp. and even a member of his own Antitrust & Monopoly Subcommittee to have a New York University economist appear before the group because the man supports the steel industry's view on prices and discounts the senator's pet theory of administered prices.

The economist is Prof. Jules Backman. U. S. Steel is basing many of its arguments (see Page 110) on his 200-page study. Sen. Everett Dirksen (R., Ill.) has asked that he be called as a witness. But Senator Kefauver's opposition may prevent the full study from ever reaching a wide public audience.

Steel's Effects Small on Consumer Prices

The conclusion of Professor Backman's work: 1. No more than 10 to 15 per cent of the components of the consumers' price index are directly affected by steel prices. 2. Steel, on the average, accounts for only 5 to 10 per cent of the prices of those items. 3. The cost of steel equals only 0.5 to 1.5 per cent of the consumers' price index.

Thus, "a rise of 4 per cent (the July boost) in steel prices equals a small fraction of 1 per cent of the consumers' price index." Professor Backman says that "the longer run, indirect effects" of a price boost will be only "moderately greater."

Tungsten Miners Look to 1958

Another metal has fallen into line behind the administration's lead and zinc program (STEEL, Aug. 12, p. 80). The Tungsten Institute is pushing "a tax on tungsten imports sufficient to establish a floor price of $45 a short ton on tungsten trioxide." That would about double today's price (including duty) of $22. Also wanted: A government purchase program for mines producing less than 1000 net tons per month.

Tungsten folks look to support from California's Stanford Research Institute. Requirements for the metal might triple if, as expected, the institute announces specifications for a new tungsten base alloy for "improved jet turbines and other uses of the Atomic Age."

No action is possible before next year; it will take a mighty effort by mining state people to switch the House's attitude. It has refused four times to aid the industry.

Wilson Relents, but 100,000 Will Go

Defense Secretary Charles Wilson will allow the Air Force to spend $17.9 billion in fiscal 1958; the Navy, $10.4 billion; the Army, $8.95 billion. That's a 25 per cent reduction in the original $1.2 billion budget cut scheduled by Mr. Wilson. The AF came out best in the three-ring grab for funds. It got $300 million more than the original budget called for.

Nevertheless, the AF officially told planemakers to cut spending by 5 per cent, except in missile work. Payrolls will have to be chopped from the current 910,000 to about 800,000.

Soapmaker Neil McElroy comes into office at the end of the month. Insiders believe Donald Quarles, once thought to be the obvious choice to replace Mr. Wilson, will resign soon after. Consensus: The AF will do as well for itself under Mr. McElroy as under Mr. Quarles. Maybe even better, because Mr. Quarles might have been too obviously pro-AF in decisions affecting relations of the three services. At any rate, no airminded senator is complaining about the appointment.

New Tax Survey in January

Democrats on the House Ways & Means Committee agreed to hold hearings on overhauling the tax structure, to make 1958 on the Hill start off with a bang.

The President maintains no cut is possible. But many circles are betting on an increase in personal tax exemptions of $100. Don't look for any reduction in the corporate rate.

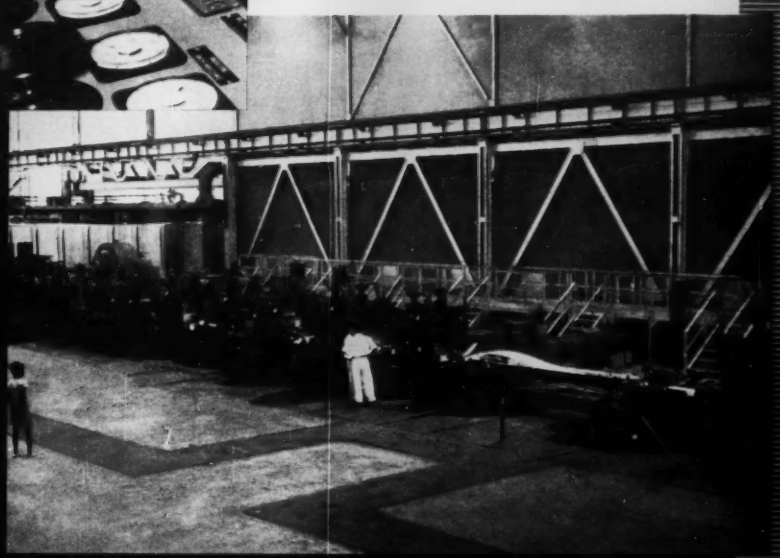
Capitol Notes

Dr. John K. Galbraith, Harvard economist and one of Sen. Estes Kefauver's (D., Tenn.) more agreeable witnesses at the Antitrust & Monopoly Subcommittee hearings, has been named the Democrat Party's top economic advisor . . . After Congress adjourns, Sen. John Sparkman's (D., Ala.) Small Business Subcommittee will tour the country investigating the impact of taxes on small business . . . Commerce Department has apportioned $2.9 billion to the states for fiscal 1958's highway program . . . Atomic Energy Commission will permit Yankee Atomic Electric Co., Boston, to build a large-scale nuclear power plant at Rowe, Mass. . . . The administration next year will present Congress with a new plan for repaying former owners of alien property taken over by Uncle Sam during World War II . . . Available from regional Labor Department offices is an explanation in question and answer form of the Federal Wage-Hour Law . . . Legislatures of Kentucky, Missouri, Ohio, and Pennsylvania have empowered officials of local jurisdictions to tax net incomes.

MORGAN MILLS
at work in India

14" SKELP MILL

Tata Iron and Steel Co., Ltd.
JAMSHEDPUR, INDIA



Since 1917 Morgan Construction Company has been contributing skilled engineering talent and precision built continuous rolling mills to the national growth of India. The mill illustrated here is a 14" skelp mill recently installed for the Tata Iron and Steel Company at Jamshedpur.

This modern skelp mill is just one example of two-hundred and twenty-one Morgan Rolling Mills that have been designed, built and installed in plants all over the world.

MORGAN
WORCESTER

MORGAN CONSTRUCTION CO., Worcester, Massachusetts

Rolling Mills • Morgoil Bearings • Wire Mills • Regenerative Furnace Control • Ejectors • Gas Producers RM 73

87 OF AMERICA'S "FIRST HUNDRED" CORPORATIONS ARE WHITING CUSTOMERS

Here's how to "clear the decks" for efficiency and profits

See how Whiting Trambeam Systems handle materials and components overhead to keep floors and aisles clear for more efficient production . . . move finished products to storage or shipping. This new, 32-page, pocket-size booklet shows the advantages of Trambeam's point-to-point transport or complete area coverage. Tells how Trambeam can be custom-engineered to your exact requirements.

There's other helpful information here, too . . . on Whiting Cranes . . . on Trackmobile, the "Road-to-Rail Convertible" that speeds handling of freight cars . . . on every Whiting product used in your type of industry. Write today for a copy of "Working for Profit". *Whiting Corporation, 15643 Lathrop Avenue, Harvey, Illinois.*

WHITING

TRAMBEAM

MANUFACTURERS OF CRANES; TRAMBEAM HANDLING SYSTEMS; TRACKMOBILES; FOUNDRY, RAILROAD AND CHEMICAL PROCESSING EQUIPMENT

USSR Power Up

U. S. delegate to Moscow meeting reports hydroelectric and electrotechnologic gains

RUSSIA has made surprising gains in electrotechnology and hydroelectric power, reports Richard C. Sogge, of General Electric Co., leader of a 24-man U. S. delegation which attended the International Electrotechnical Commission meeting in Moscow last month.

A 1000-mile direct current transmission line from Moscow to power sources in Siberia is being planned, says Mr. Sogge, president of the U. S. National Committee of IEC, a branch of the American Standards Association.

No Secrecy—"We were all surprised," adds Mr. Sogge, "that the Communists were so free in showing us installations of real interest to our technical group. Also we were constantly asked for criticism of what we saw."

He reports that some plant equipment is much older than that used in the U. S. but "appeared to be in good running condition," but that accident prevention and plant housekeeping is below U. S. standards.

The Russians told Mr. Sogge and his group that they have 400-kv power circuits in operation as well as turbogenerators rated at 150,000 kva. The group was told that 200,000-kva generators are in the process of construction.

No Politics—The Russians made no attempt to use the meetings for political purposes, Mr. Sogge says, adding that English was the language used throughout.

More than 500 delegates from 27 countries attended the meetings.

S. David Hoffman, American Standards Association, one of the group, reports he was asked to explore possibilities of exchange of electrical engineers and technicians between the two countries. Nikolai P. Calochkin, chief, foreign relations, and A. Nekrosov, chief, technical department, both of the ministry of power stations, discussed the matter with Mr. Hoffman.

A. S. Pavlenko, successor to Georgi Malenkov as minister of power stations, chairmanned arrangements for the event.

Gets Set for Atomic Market

In anticipation of the coming European market for atomic power plants, W. E. Knox, president, Westinghouse Electric International Co., Pittsburgh, announces a technical agreement with Ateliers de Constructions Electriques de Charleroi (Belgium).

"The coming market in Europe for atomic power will far exceed U. S. productive capacity and the dollar availability of the six Euratom countries," believes Mr. Knox. Euratom is the co-operative atomic organization of Belgium, France, Italy, the Netherlands, Luxembourg, and West Germany.

"Euratom plans to spend $5.5 billion on nuclear plants during the next ten years. A maximum of $1.1 billion will be spent outside the area and the Charleroi firm will be prepared to play a leading role in meeting the vast demand," he concludes.

Meanwhile, the World Bank is studying, in co-operation with the Italian government, the feasibility and problems of constructing a large nuclear power station in southern Italy.

Eugene R. Black, World Bank president, says that the bank has already invested more than $1 billion in power projects around the world and that the Italian study "will point the way to bank lending operations in this new and challenging field."

UK Autos Hit All-Time Peak

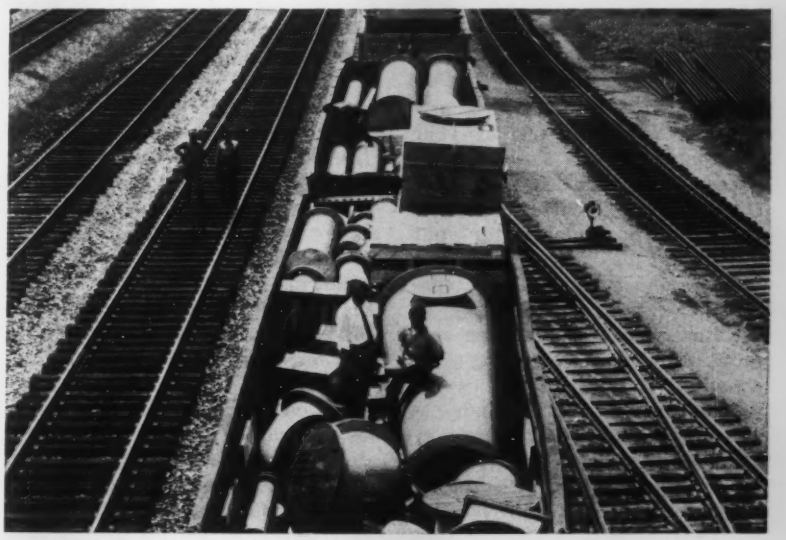
Overseas earnings of the British automotive industry hit the all-time peak of $617.4 million for the first half of 1957. Nearly 1600 units were exported every working day for the period for a total of 205,000.

The U. S. was the chief receiver, taking 43,000 units, three times as many as were sold here during the first six months of 1956. Canada is the next best customer.

Rising costs of steel and fuel are causing some concern because of stiff competition in the export market. British manufacturers now enjoy a price advantage in raw materials. However, order books are reportedly "in a healthy position" for the remainder of 1957.

German Steel Firm Has Gain

August Thyssen-Huette A. G., Duisburg, Germany, reports gross sales up 38 per cent to $172.2 million during the past year.



Japanese Buy U. S. Equipment To Clean Sheet Steel
This wide-strip continuous pickling line is bound from B. F. Goodrich Industrial Products Co., Akron, to Kawasaki Steel Corp., Yokohama

Help Foremen Manage Labor Contracts

_____1. Do you keep a record of all grievances and analyze them to determine the basic causes of disputes and possible contract revisions which might eliminate them?

_____2. Do your foremen understand the basic fundamentals of a labor contract, the rights and objectives of a union?

_____3. Do you seek the foremen's suggestions for contract improvements prior to opening union negotiations?

_____4. Do you immediately conduct sessions for the foremen to acquaint them with a new contract?

_____5. Do you keep foremen informed, on a continuing basis, on grievances and settlements that occur under the contract?

_____6. Do you try to maintain the prestige of the foreman by backing him in his decisions, even though his judgment might be wrong?

_____7. Do you emphasize and assist foremen in learning to use a human relations approach to contract administration?

_____8. Do you encourage an informal atmosphere between foremen and your industrial relations department so that foremen readily seek assistance when in doubt about an unusual situation?

_____9. Do you provide the foreman with special aids such as interpretations or synopses of those contract provisions affecting his activities?

Make Your Labor Pact Work

LOOK TO your foreman if you want the maximum out of your labor contract.

Because he is on the firing line of labor-management relations in his day-to-day contact with your employees, his effectiveness in working under your labor contract depends upon:

1. How well he knows the contract provisions affecting his sphere.

2. How well he understands the reasons behind the company's interpretation of these provisions.

3. Whether he has the ability to recognize that faint, thin line between strict legal adherence to a labor contract and a common sense treatment of the contract as a "human document."

To help their foremen develop that combination, more and more firms are turning to supervisors for suggestions to improve the labor contract before bargaining time. They're holding contract sessions with foremen immediately following settlement. They're maintaining a continuing program of keeping foremen informed on all facets of labor contract administration.

Payoff for these programs can be measured directly in the reduction of grievances filed and in the number going above the first and second procedure steps. Indirectly, it shows up in improved production.

Solicit Suggestions—But don't go to foremen cold and ask for a "laundry list" contribution.

One midwest metalworker tried that approach and failed dismally. Admits the industrial relations executive: "The lesson we learned was that our foremen didn't understand the fundamentals of a labor contract.

"We started biweekly foremen conferences and the educational program we conducted showed up to advantage the following year when we sought—and got through these conferences—some worthwhile contract improvement suggestions."

By Questionnaire—Many companies follow an approach similar to Electro-Motive Division of General Motors Corp. "We survey our foremen prior to negotiations with a questionnaire," says E. X. Humphrey, director of industrial relations. "It contains all of the current contract provisions. Foremen indicate whether they feel the

Boeing Airplane Co.

provision is O.K., could be improved, or unsatisfactory. Space is provided for comments."

And Grievance Records—Another practice is for the industrial relations department to keep a record of all grievances. Before contract opening time, the grievances are analyzed in discussion meetings between industrial relations personnel and foremen to determine the major causes of disputes and contract revisions which might eliminate the problem.

Explain the Contract—Once you've hammered out and signed a new contract with the union, take it to the foremen and explain it, emphasizing any changes from former provisions. Timing is important because:

1. The quicker the foremen learn the new contract, the less chance of situations developing according to past practice which must be changed under new provisions.

2. Foreman prestige is involved. If he knows the new provisions before the shop union representatives, employees will go to him for the answers to their questions.

Within a six-month period in 1955, the Farmall Works of International Harvester Co., Rock Island, Ill., faced two major contract changes. In February its bargaining agent was changed from the Farm Equipment-United Electrical Workers to the United Auto Workers. Then, in September, a new master contract with UAW and IH was negotiated. Farmall handled the situation this way.

Immediately — "In changing unions, we got a completely new contract. Timing became important because we wanted our foremen to get started on the right foot," explains R. J. Black, manager-industrial relations.

"Because our wage provisions differ between daywork and piecework, we decided to separate the foremen into two groups when these provisions were discussed. This permitted emphasis on the wage provisions affecting the individual foreman. Later, he got an over-all shot at the entire wage provision."

With Emphasis—A second major decision, relates Mr. Black, was the matter of emphasis on the overall contract. Certain sections were necessary to cover in a crash-type program, but Farmall decided that an educational job during the initial period would result in less calls on the industrial relations department by the foreman. This would save time and probably add to the foreman's prestige in being able to cope with a problem on the spot.

With these two objectives, Farmall set up a program for its 350 foremen and supervisors on the first Monday after the contract was signed. Three 90-minute conferences were held daily.

In Small Groups—Classses were limited to 20, permitting opportunity for each foreman to ask questions. One training aid which proved effective was the use of synopses of important contract provisions. As the various contract sections were covered, the foremen got copies of the contract, plus synopses for ready reference.

Continue Training—Probably the most important factor in helping your foremen get the maximum out of your contract is a continuing program of: Keeping the foremen informed of what's happening under your contract. Helping him develop better human relations techniques to avoid the unnecessary and volatile incidents arising over strict application of contract language.

By Case Studies—Electro-Motive makes copies of all decisions made on appealed grievances and distributes them for foremen to read.

By Dry Run—The Associated Industries of Cleveland conducts foreman training in co-operation with the Cleveland Board of Education. Covered are human relations, contract language and interpretations of provisions. Emphasis is also placed on role playing which gives the foremen practice in making decisions under staged situations which might occur under shop conditions.

By Assistance—Most companies place limits on the foreman's authority to handle disputes—in the more serious ones, foremen must take the issue up with their superiors or the industrial relations department. The key here, industrial relations executives believe, is maintaining an informal atmosphere between industrial relations representatives and the foremen.

By Explaining Errors — What occurs when the foreman errs and makes promises under wrong interpretation of the agreement? "This does happen," says Mr. Humphrey of Electro-Motive. "Our practice is to back the foreman in his decision if possible. But we tell the union that a mistake was made and that the practice will not be allowed again. Then we explain to the individual foreman his error."

In living with their labor contract, most industrial relations executives stress common sense. No contract has ever been written that can be administered to the legal letter without creating conflicts. Never sacrifice on basic principles in a contract. But in the details, a common sense approach can often avoid a volatile situation which could backfire at the next bargaining session.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*

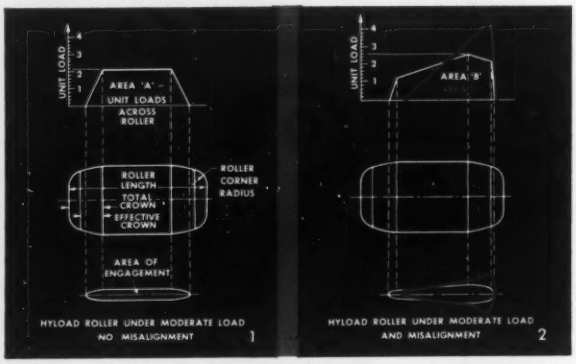
ONE OF A SERIES . . .

What makes Hyatts run smoother and longer?

PROPER LOAD DISTRIBUTION ON ROLLERS

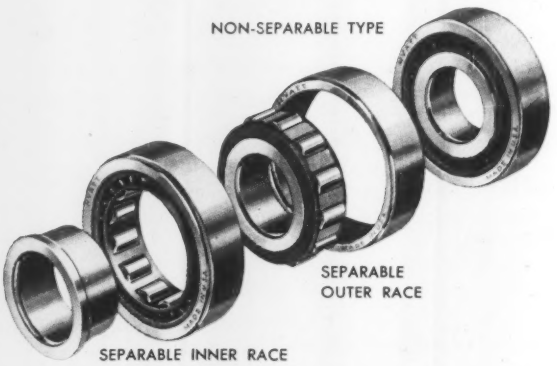
In any roller bearing, the design and quality of the rollers themselves vitally affect the performance of the entire bearing. The distribution of the load, both within the roller's area of contact and across the roller, must be expertly engineered. End-loading and conditions of misalignment can seriously reduce the life of a roller bearing. How HYATT minimizes these effects is detailed at the right.

You will find full selection and application data in HYATT Catalog 150, or call your nearest HYATT Sales Engineer. Hyatt Bearings Division, General Motors Corporation, Harrison, N.J., Pittsburgh, Detroit, Chicago and Oakland, Cal.



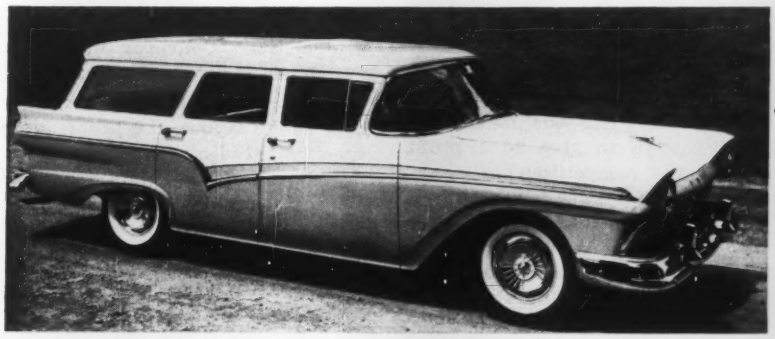
ROLLER CROWNING MINIMIZES EFFECTS OF BEARING MISALIGNMENT

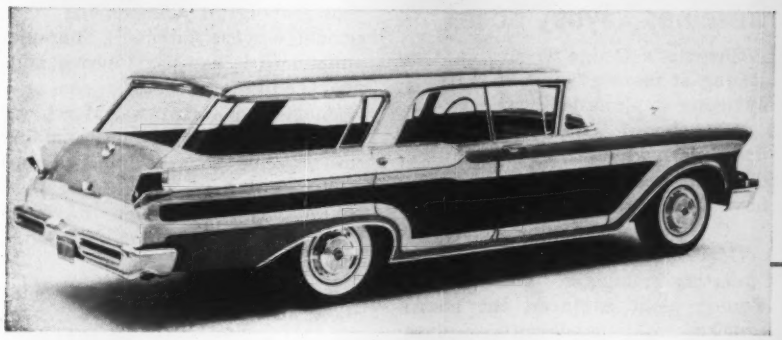
The unit load on any roller is distributed axially in a uniform manner except at the ends where crowning has been provided. Figure 1 shows how the unit load drops off to zero at the ends of the area of contact. The summation of unit loads represented by area "A" is the total roller load. This same load under conditions of misalignment (Figure 2) must result in an area "B" equal to area "A"; but the maximum unit load is considerably greater and the misaligned bearing will therefore have a shorter life. However, if the same total load is applied to an uncrowned roller in a misaligned bearing, as shown in red, a much higher unit load (area "C") results, which would still further reduce the life of the bearing. This demonstrates graphically why HYATT Hy-Load Series Bearings with roller crowning will run smoother and longer under conditions of misalignment.



GM GENERAL MOTORS

HYATT HY-ROLL BEARINGS FOR MODERN INDUSTRY





Ford Leads

Station Wagon Sales

(Thousands of units)

1958	910†
1957	850*
1956	600*
1955	759
1954	349

Source: Automobile Manufacturers Assn. (totals adjusted).
†Estimated by STEEL.
*Ford Division, FMC.

Mercury Recovers

Wagon Boom Continues

Some 11 per cent of all cars sold in 1957 will be station wagons, for a total of nearly 850,000. Sales should stabilize at 12 to 15 per cent of the market by 1960

STATION WAGON SALES have recovered from last year's slump. This year will see record shipments of the suburbanites' dream car.

J. O. Wright, Ford Division general manager and company vice president, predicts nearly 850,000 wagons will be sold in 1957.

"So far this year, one out of every nine cars sold is a station wagon," he adds.

Penetration—Even though sales last year slipped below 1956 estimates, the industry wasn't too disappointed because wagons accounted for 11 per cent of the market compared with 9 per cent in record '55.

Ford, leader in sales, asserts station wagons are the fourth most popular body style. In the first six months, Ford Division sold 149,000 wagons—nearly 20 per cent of all its output.

Predicted—And as STEEL predicted last year (Aug. 6, Page 91), Mercury has recovered from its sales slump to ninth place.

According to F. C. Reith, Mercury general manager and vice president: "Sales of Mercury station wagons during the second quarter of 1957 were nearly twice the total sold in the same period last year and represent more than 18 per cent of retail deliveries."

The Big M is leading the medium price class, says *Ward's Automotive Reports*. The industry's statistical bible shows Mercury taking 23 per cent of medium priced sales, compared with 15 per cent in 1955 and '56.

Class Conscious—This class generally accounts for 22 to 23 per cent of the wagon market. Low priced six-cylinder models take 20 to 21 per cent.

The big slice comes from low priced V-8s which are picking up over 55 per cent of wagon sales this year.

Although demand for wagons still is booming, marketing folk suspect sales will stabilize at around 12 to 15 per cent of the market by 1960 or '61.

And 14 per cent of 6.5 million sales means 910,000 wagons may be sold next year. That's a fast and steady climb from the 2 per cent of total sales wagons accounted for in 1950.

Buyers Prefer—In the last seven

years the industry has pinpointed definite trends that will affect wagon body styles.

- The two-door wagon is losing out. It makes up less than a third of total sales.
- Most wagons go to the suburban set. If further proof is needed, Edsel has named its five wagons Roundup (one model), Villager (two models), and Bermuda (also two) in ascending price order.

Versatility — The basic wagon concept is well established now. Aside from annual styling changes that apply to all cars, manufacturers will suggest a host of accessories to transform wagons into everything from tractors to house trailers.

Ford already has taken steps in this direction. It recently distributed a pocket book of tips and buying guides for station wagon living.

AMC Confirms Rumors

American Motors Corp. has confirmed what autodom circles have been hinting for several months—that it will introduce a car with a shorter wheelbase in '58.

George Romney, AMC president, says the car is a modified version of the 1954 Rambler. It will have a 100-in. wheelbase rather than 108-in.

"It will be nearly 3 ft shorter and 4 in. narrower than the average American-built car," he adds.

This will give AMC a five-car lineup for 1958: Metropolitan, Rambler, Nash, Hudson, and the 100-in. job.

Two Sizes — This move on the part of AMC makes it more apparent there will be at least two sizes of economy cars competing for the 250,000 United States buyers who are scheduled to buy small cars next year.

AMC's tiny Metropolitan is representative of one class and GM's Vauxhall Victor typifies the larger group.

Two Prices—Prices will range from less than $1000 for some of the smaller cars to around $2000.

It will be some time before the small car market hits half a million units a year. Most estimates place sales between 250,000 and 350,000 until 1960.

Gives Choice—Right now there are seven manufacturers with definite plans for copping a share of that market: Ford, GM, AMC, Volkswagen, Volvo, Renault, Fiat.

At least four other companies would like to get in the act.

To Hit or Run—The question most of these firms would like answered is: "Will the market be large enough to give us a profit despite the competition?"

So far the answer has been yes. But as more manufacturers enter the game, the small car market adopts a musical chairs aspect—somebody will drop out when the music stops.

Develops Layout Board

Chrysler's Dodge Truck plant is aiming at more efficient operations by using a plant layout board.

"The board gives a visualized floor plan which will replace the three-dimensional layouts which have been used previously," says M. C. Patterson, Dodge president.

Developed by Murray Aitken, operating manager, and George Young, plant engineer, the board consists of sandblasted glass plates over fluorescent lights.

Milar grid sheets (3 x 4 ft) ruled in ¼-in. squares are placed over the glass. Layouts are drawn to a scale of ⅛ in. to 1 ft.

Color coded templates representing equipment, machinery, and stock can be placed on top of the grid sheets. Conveyor lines also are shown in different colors.

When a department wants a copy of its layout, the proper grid sheet is lifted off the glass and a print made of it. Prints are made of each change and filed for future reference. The layout board will be adopted by other divisions.

U.S. Auto Output

Passenger Only

	1957	1956
January	642,089	612,078
February	571,098	555,596
March	578,826	575,260
April	549,239	547,619
May	531,365	471,675
June	500,271	430,373
July	495,629	448,876
7 Mo. Total	3,868,517	3,641,477
August		402,575
September		190,726
October		389,061
November		581,803
December		597,226
Total		5,802,808

Week Ended	1957	1956
July 13	111,943	112,361
July 20	124,894	113,416
July 27	119,857	111,247
Aug. 3	119,323	111,157
Aug. 10	120,436†	108,167
Aug. 17	120,000*	98,348

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Mercury Holds Conclave

As part of the recent industry push to bolster harmonious relationships with suppliers, Mercury announces it has developed a supplier conference series.

Charles S. Brown, Mercury's general purchasing agent, explains the program is aimed at bringing divisional P.A.s closer to the 1500 suppliers who sell Mercury more than $450 million worth of goods and services each year.

A dozen newly acquired suppliers are invited to send key representatives to a half-day conference at Mercury's Dearborn, Mich., offices.

Then they're introduced to special forms, orders, and abbreviations peculiar to the division.

"To translate strange abbreviations into understandable English can involve many phone calls and lost time for both the supplier and our purchasing personnel," says Mr. Brown.

He thinks the buyer-seller conference is a good way to improve relationships and make more efficient operations for both parties.

Mercury's next supplier conference is scheduled for the end of this month.

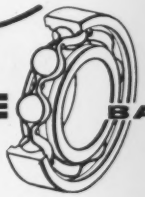
Exhaust Notes

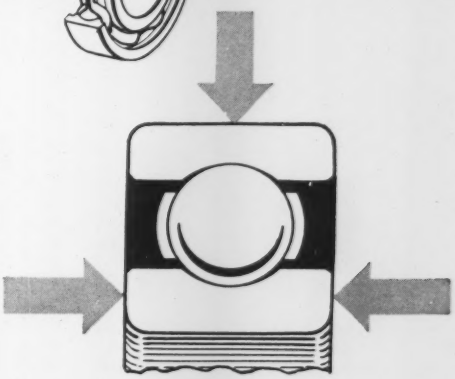
- Commercial tire rebuilders will be given a major share of military tire rebuilding now being done by ordnance shops, says Maj. Gen. Nelson M. Lynde Jr., commanding general of the Army's ordnance tank-automotive command.
- Lincoln produced 41,123 cars in its 1957 model run. That's 9000 less than the 50,322 turned out in 1956.

FACTS

about

NEW DEPARTURE BALL BEARINGS





The Word *Versatile*

Fits Like A Glove!

Fits because—this basic New Departure ball bearing, more widely used than any other antifriction type, does much more than carry RADIAL loads—it locates the shaft it supports against THRUST LOADS FROM BOTH DIRECTIONS equally well!

Fits because—with a simple snap ring added, it does away with inside housing shoulders, simplifying mounting and cutting machining costs!

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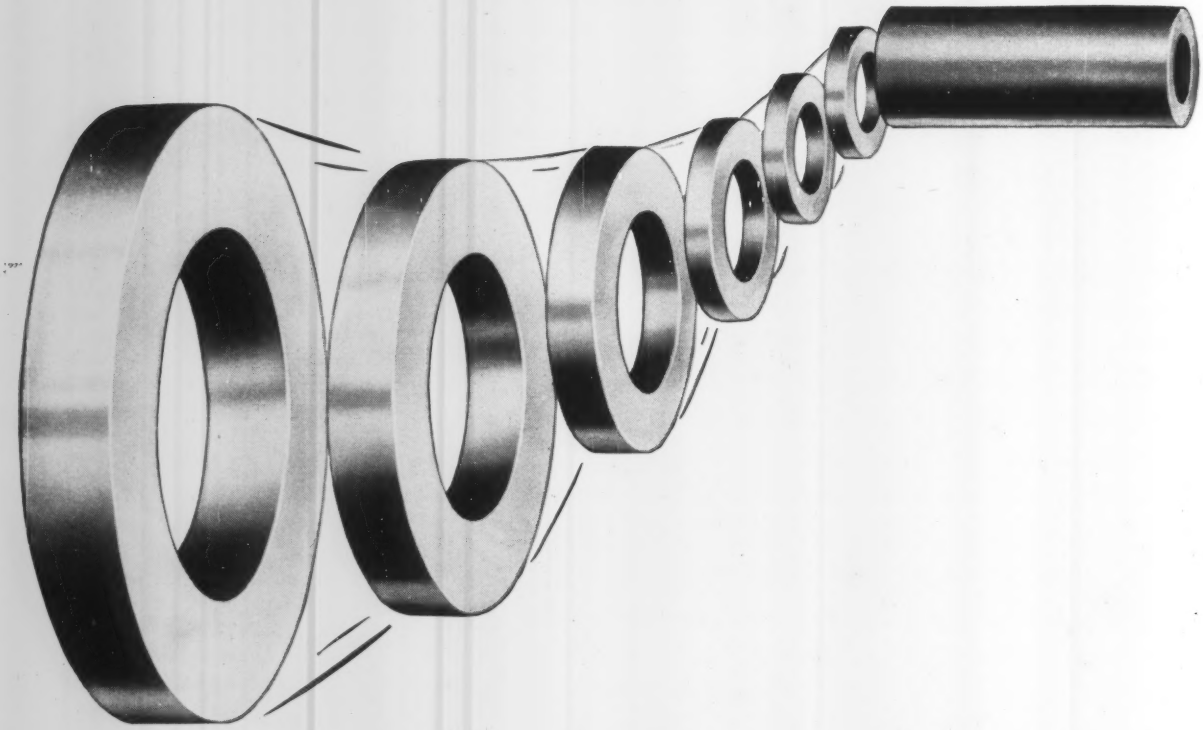

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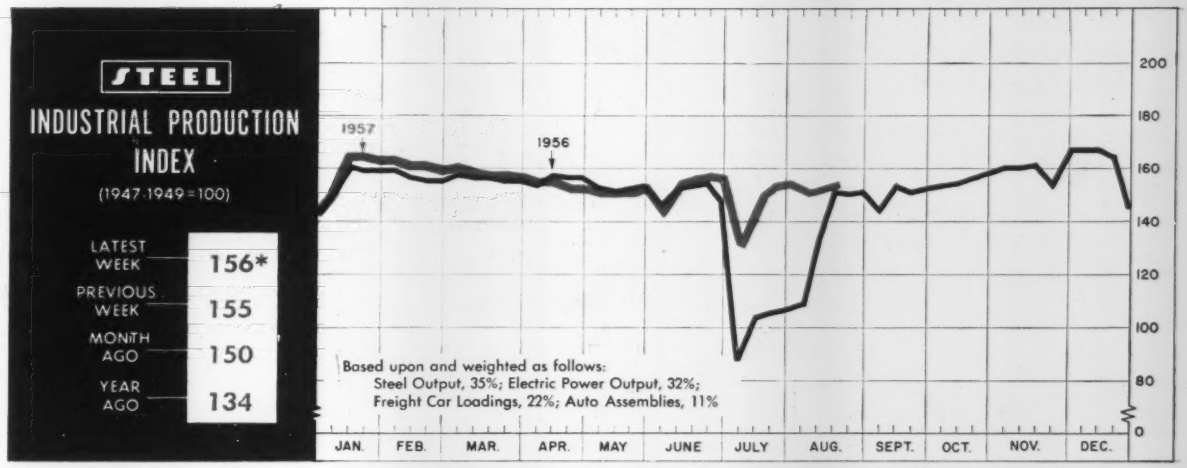

*Week ended Aug. 10.

Production Riding High Through Summer

INDUSTRIAL production is surprising many people with its show of strength this summer. As measured by STEEL's index (above), it is setting records for this time of the year.

While it is true that not all segments of metalworking are sharing in this prosperity, the fact remains that other elements are riding high enough to pull the over-all level up to a point only slightly below the all-time record of the fourth quarter of last year. The highest the index ever went is 168 (1947-49=100) last December. The preliminary figure for the week ended Aug. 10 is 156, the highest in six weeks and only 7.1 per cent below the record. A variation that small between the strongest and the weakest seasons of the year attests to the soundness of production.

Psychological Slump — A year ago, a reading of 156 on the index would have been only a little less than phenomenal, because it represented nearly the capacity of industry. Today, there is enough additional capacity that even at such high levels, facilities are idle or operating on less than a full schedule. In addition, industry was still in a strong upsweep last summer—demand was high and production was higher. Even though that pressure has been reduced, the industrial machine continues to run on its own momentum. But the excitement—or just plain glamour—has vanished, resulting in a letdown feeling. An examination of the facts doesn't give much basis for that letdown.

Among the four elements making up STEEL's index, three are holding steady and one—electric output—is heading for a record. Aided by steady use of air conditioners during late July and early August, the nation's electric power plants have come close to shattering the weekly record of 12.556 billion kw-hr set during the week ended Jan. 19. Another week of 90-100° F weather not only would

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,097[1]	2,043	2,154
Electric Power Distributed (million kw-hr)	12,500[1]	12,474	11,530
Bituminous Coal Output (1000 tons)	9,695[1]	10,120	9,205
Petroleum Production (daily avg—1000 bbl)	6,900[1]	6,843	7,086
Construction Volume (*ENR*—millions)	$298.3	$401.0	$322.8
Auto, Truck Output, U. S., Canada (*Ward's*)	139,014[1]	140,253	133,257
TRADE			
Freight Car Loadings (1000 cars)	745[1]	740	690
Business Failures (Dun & Bradstreet)	281	228	282
Currency in Circulation (millions)[3]	$30,983	$30,909	$30,633
Dept. Store Sales (changes from year ago)[3]	−1%	+4%	+7%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$21,053	$20,871	$19,493
Federal Gross Debt (billions)	$271.9	$272.8	$272.5
Bond Volume, NYSE (millions)	$16.3	$16.1	$17.2
Stocks Sales, NYSE (thousands of shares)	9,422	8,873	11,540
Loans and Investments (billions)[4]	$86.4	$86.2	$84.6
U. S. Govt. Obligations Held (billions)[4]	$25.2	$25.2	$26.0
PRICES			
STEEL's Finished Steel Price Index[5]	239.15	239.15	225.71
STEEL's Nonferrous Metal Price Index[6]	214.3	216.8	261.7
All Commodities[7]	118.0	117.9	114.2
Commodities Other Than Farm & Foods[7]	125.5	125.5	121.9

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1957, 2,559,490; 1956, 2,461,893. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

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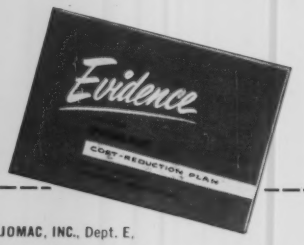

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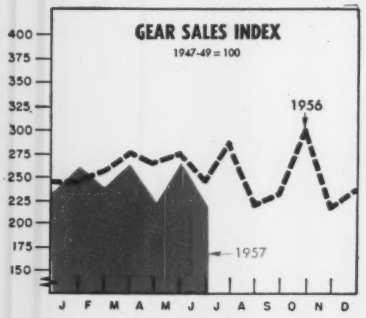
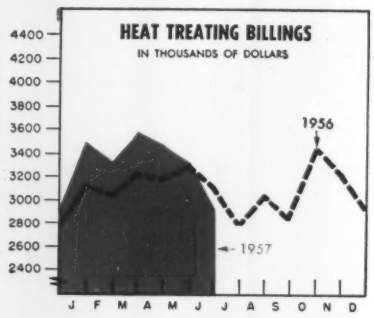
City_____ State_____

THE BUSINESS TREND



	1957	1956	1955
Jan.	259.3	245.5	140.9
Feb.	239.5	256.2	148.5
Mar.	262.4	276.5	172.8
Apr.	221.7	264.7	179.8
May	263.2	275.6	205.2
June	215.9	245.4	193.5
July	....	286.7	201.7
Aug.	....	219.5	217.6
Sept.	....	230.5	246.5
Oct.	....	299.8	227.6
Nov.	....	216.2	210.4
Dec.	....	235.7	245.5
Avg.	....	254.4	198.3

American Gear Mfrs. Assn.



	1957	1956	1955
Jan.	3,494.7	3,116.4	2,181.0
Feb.	3,337.9	3,124.8	2,184.5
Mar.	3,571.6	3,330.9	2,599.5
Apr.	3,462.6	3,166.2	2,579.5
May	3,311.4	3,350.7	2,644.4
June	2,912.1	3,094.5	2,645.1
July	.....	2,762.5	2,180.0
Aug.	.....	3,040.7	2,535.6
Sept.	.....	2,832.9	2,666.8
Oct.	.....	3,442.3	2,897.2
Nov.	.....	3,205.7	2,935.7
Dec.	.....	2,931.2	2,891.1

Metal Treating Institute.

Charts copyright, 1957, STEEL.

set a new record but also would make producers of air conditioners happy.

Except for holiday weeks, freight car loadings have held in the 730,000 to 750,000 bracket since the first week of June. With the same exception, production of cars and trucks has held close to 140,000 units a week, with only a slight drop in prospect before model changeovers begin in earnest in September. Steel production has been inching up since July 4, but no spectacular improvement is anticipated until late September.

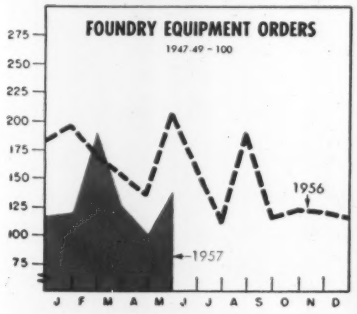
Bellwethers Mix It Up

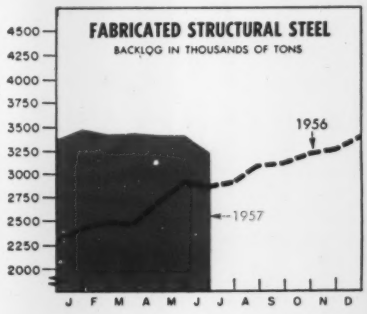
The trends of two of metalworking's traditional bellwether industries illustrate the rolling adjustment that is underway. The gear industry (see chart above) has been in a general downtrend since January. The American Gear Manufacturers Association reports that bookings for the first half of 1957 declined 4 per cent from the comparable period of 1956. On the other hand, the seasonally adjusted index of the American Supply & Machinery Manufacturers' Association Inc. appears to have leveled off after a moderate dip. The average for the first half was 208.5 (July, 1948 = 100) compared with a corresponding 1956 average of 193.5.

Looking further at the charts and tables above, we see that for the second consecutive month, billings for heat treating have fallen below the year-ago figures. (For the first six months, business was still ahead of the 1956 period by 5.3 per cent.) But manufacturers of foundry equipment in June had one of their best months. (The average for the first six months was only 142.9, compared with the year-ago average of 169.4.) With such diversified trends, it is hard to say that the economy is going up or down. Rather, it is going sidewise.

Turning Point for Housing?

"Perhaps the best thing that future historians of home building will be able to say of it is that 'around the middle of 1957, the turning point came.'" So says F. W. Dodge Corp. "The trends in contract awards so far this year have been mixed, but most categories have gone in the direction of more, rather than less, with the result that total construction





	1957	1956	1955
Jan.	117.9	195.6	81.0
Feb.	188.4	169.0	90.4
Mar.	127.0	152.7	163.6
Apr.	101.1	135.2	178.6
May	136.2	207.0	145.7
June	187.5	156.7	186.8
July	....	110.3	213.4
Aug.	....	188.3	134.0
Sept.	....	114.7	156.7
Oct.	....	122.2	108.6
Nov.	....	121.0	154.4
Dec.	....	115.6	183.9
Avg.	....	149.0	150.0

Foundry Equipment Mfrs. Assn.

	Shipments 1957	Shipments 1956	Backlogs 1957	Backlogs 1956
Jan.	282.2	251.5	3,476	2,408
Feb.	278.5	285.4	3,436	2,476
Mar.	305.0	306.8	3,454	2,463
Apr.	313.6	289.6	3,416	2,687
May	329.6	306.2	3,417	2,896
June	329.3	284.7	3,220	2,859
July	....	165.5	....	2,904
Aug.	....	213.5	....	3,076
Sept.	....	240.9	....	3,108
Oct.	....	287.6	....	3,215
Nov.	....	276.0	....	3,252
Dec.	....	297.8	....	3,373
Total	....	3,205.5		

American Institute of Steel Construction.

contracts in the first half of 1957 ran 5 per cent ahead of the same period of 1956," declares George Cline Smith, vice president and economist of F. W. Dodge. Both heavy engineering and nonresidential building were at record heights for the first half of the year. With even a slight boost from residential, 1957 could be a record breaker.

Even without that boost, the dollar value of construction is destined to set a new mark. *Engineering News-Record* reports that its construction cost index advanced 14.48 points from July to August, the biggest monthly jump since January, 1947. Both wage increases and higher steel prices contributed to the increase, which already shoves the index above the point which *EN-R* had predicted for the end of 1957.

Employment at Record

More people are employed in the United States today than ever before. According to the Departments of Labor and Commerce, total employment reached a new high of 67.2 million in mid-July, beating the old record set last August. In each of the last four years, the August total has exceeded that for July by 100,000 to 450,000. The gain this year probably will be held to the minimum figure because of cutbacks in the aircraft industry and a poor season on the farm. However, the Security-First National Bank of Los Angeles, where much of the aircraft industry is centered, expects the net reduction in local employment to be less than 1 per cent because of substantial new contracts for the Snark missile.

Gas Lines Still Expanding

Producers of line pipe and compressors and related equipment see no letup in business because of the huge volume of natural gas construction applications still before the Federal Power Commission. The Gas Appliance Manufacturers Association reports that the natural gas industry has asked approval for $1.25 billion worth of projects since Jan. 1. GAMA points out that FPC approved projects costing $549 million last year, bringing the total since July 1, 1945, to about $5.6 billion. The 1956 projects involved 1,169,984 tons of steel pipe and compressors aggregating 358,975 hp.

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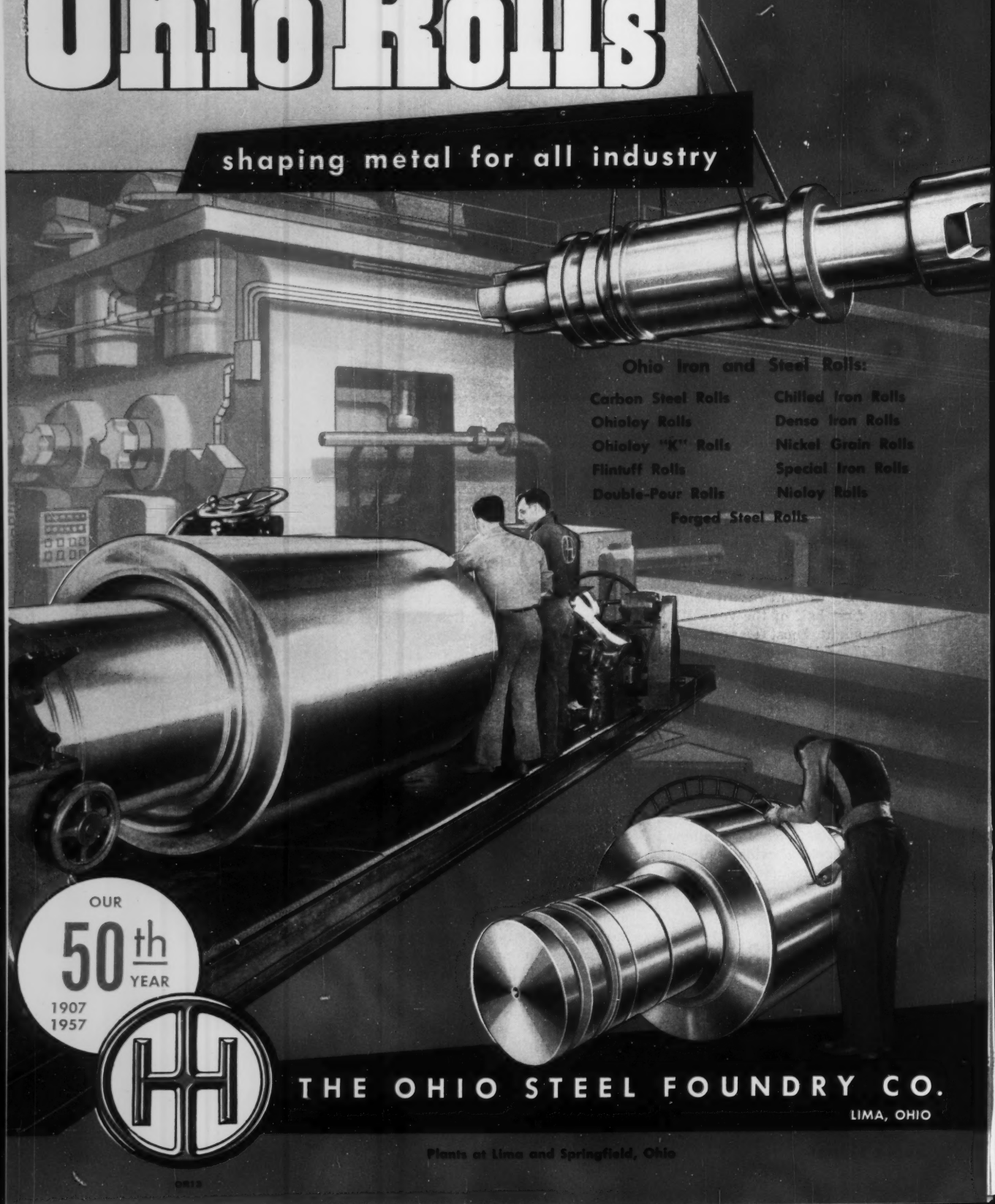
Ohio Rolls

shaping metal for all industry



Ohio Iron and Steel Rolls:

Carbon Steel Rolls
Ohioloy Rolls
Ohioloy "K" Rolls
Flintuff Rolls
Double-Pour Rolls
Chilled Iron Rolls
Denso Iron Rolls
Nickel Grain Rolls
Special Iron Rolls
Nioloy Rolls
Forged Steel Rolls

OUR 50th YEAR
1907
1957

THE OHIO STEEL FOUNDRY CO.
LIMA, OHIO

Plants at Lima and Springfield, Ohio

OR13

ANSON W. KRICKL
Badger mgr. of mfg.

IVAN A. BICKELHAUPT
Mount Vernon Co. president

DR. THORNTON C. FRY
Remington Rand vice president

JAMES W. BROWDER
Western Design sales mgr.

Badger Mfg. Co., Cambridge, Mass., appointed **Anson W. Krickl** general manager of manufacturing. He was with Catalytic Construction Co.

Mount Vernon Co., Mt. Vernon, Ohio, elected **Ivan A. Bickelhaupt** president, succeeding **Clyde G. Conley** who was elected chairman of the executive committee. Mr. Bickelhaupt was with Pittsburgh-Des Moines Steel Co.

Charles E. Martin was named general service manager and member of the executive committee, **Cummins Engine Co. Inc.**, Columbus, Ind. Former manager-field service, he succeeds **H. E. Bollwinkel**, who resigned.

Westinghouse Electric Corp., Pittsburgh, appointed **Richard C. Lipps** manager and **Harry J. Bichsel** engineering manager of its welding department.

John D. Gordon was made general manager-Detroit operations for **Congress Drives Div.**, Tann Corp. He was vice president and general manager, Progressive Welder Sales Co.

Reginald G. Schuler was named general engineering manager, **Brush Electronics Co.**, Cleveland. He was director of engineering, Badger Meter Mfg. Co.

Lyndon Aircraft Inc., Newark, N. J., appointed **Marvin Marquit**, former president of Mohawk Gear & Instrument Corp., manager of its new Design & Fabrication Dept.

Dr. Thornton C. Fry was appointed vice president and director of Univac engineering for **Remington Rand Div.**, New York, Sperry Rand Corp. He was consultant to International Telephone & Telegraph Corp. and to Remington Rand.

Ernest T. Goddard was made traffic manager, **Washington Iron Works**, Seattle. He succeeds **Lee Hewitt**, retired.

James Biggers joined **Pacific Coast Engineering Co.**, Alameda, Calif., as general superintendent. He was plant superintendent, Dresser Industries Inc.

Frank Glaser was named vice president, **Mercast Corp.**, New York. He also is executive vice president, Alloy Precision Castings Co., a Mercast subsidiary.

Diamond Alkali Co., Cleveland, promoted **James P. Okie**, former assistant general manager, to general manager of its Plastics Div. He succeeds **A. L. Geisinger**, vice president, who will retire Dec. 31.

H. D. Barnes, manager of defense products for **A. O. Smith Corp.**, Milwaukee, has been given the assignment of managing its atomic equipment section.

RCA Communications Inc., New York, appointed **Sidney Sparks** as vice president-operations and engineering; **Lon A. Cearley**, vice president - finance; **Frederick J. Sager**, vice president - treasurer, and **Edwin W. Peterson**, controller.

James W. Browder was named sales manager, **Western Design & Mfg. Corp.**, Santa Barbara, Calif. He was west coast regional manager for Emerson Research Laboratories.

Robert W. Frank joined **Birdsboro Steel Foundry & Machine Co.**, Birdsboro, Pa., as vice president. He was vice president-mill machinery sales of Blaw-Knox Co.

W. Harrison Faulkner Jr. was promoted to general manager-engineering and development, **Tracerlab Inc.**, Waltham, Mass. He was chief engineer of the industrial division.

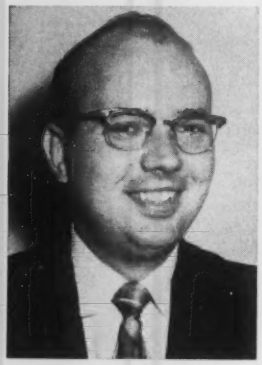
John D. Simpson joined **National Electric Products Corp.**, Pittsburgh, as treasurer, succeeding **John L. Auch** who resigned due to illness. He was treasurer and chief financial officer of Economics Laboratory Inc.

Harold F. Wiley was named director of the new Analytical & Control Instrument Div., **Consolidated Electrodynamics Corp.**, Pasadena, Calif. He was director of its Technical Services Dept.

Robertshaw-Fulton Controls Co., Greensburg, Pa., appointed **Beverly D. Taylor** treasurer to succeed **Walter H. Steffler** who will continue as the company secretary. Mr. Taylor was controller.

Dr. Oscar T. Marzke will become vice president - fundamental research, **United States Steel Corp.**, Pittsburgh, effective Sept. 1. He

JOHN LORANN



ROBERT C. HIGGINS

appointments at Fulton Steelcraft

NICHOLAS P. VEEDER

JAMES L. HAMILTON JR.

Granite City Steel executives

is now director of research, U. S. Naval Research Laboratory.

Fulton Steelcraft Co., Swanton, Ohio, named **John Lorann** vice president-manufacturing. He was works manager. **Robert C. Higgins** was promoted to chief engineer.

Gregg A. DeLong was made manager-reinforcing bar division of U. S. Steel Corp.'s **U. S. Steel Supply Div.**, Chicago. He was assistant manager of sales.

Simmonds Aerocessories Inc., Tarrytown, N. Y., promoted **Gerald J. McCaul** to vice president-contracts and service from manager-contracts and service division, and **Myron G. Domsitz** to vice president-research and development from chief engineer, research and development.

William E. Vogel has been appointed assistant manager of **Atlas Drop Forge Co.**, Lansing, Mich., a subsidiary of Dana Corp.

R. J. Keller was made chief engineer of Welding Products Div., **A. O. Smith Corp.**, Milwaukee. He will be in charge of engineering for the company's three welding products plants at Milwaukee, Elkhorn, Wis., and Leola, Pa.

Frank C. Russell, recently recalled to act as director of sales and marketing, was elected president and chief executive officer, **F. C. Russell Co.**, Cleveland, succeeding **William Tucker**, resigned.

Samuel Salem joined **A. M. Byers Co.**, Pittsburgh, as vice president in charge of sales and manufacturing. He was assistant director of manufacturing for General Tire & Rubber Co.

W. P. Metcalf was appointed assistant purchasing agent, **Air Reduction Co. Inc.**, New York. He was purchasing agent for its National Carbide Co. Div.

Reynolds Metals Co., Louisville, appointed **John C. Neely** general manager of its new residential window division.

A. P. Stuhrman was made manager of Central Mfg. Div., **Consolidated Electrodynamics Corp.**, Pasadena, Calif. Former director of quality control, he succeeds **William D. Nesbit**, resigned.

Robert C. McNeill was appointed chief engineer, **Martin - Decker Corp.**, Long Beach, Calif.

Carpenter Steel Co., Reading, Pa., named **Basil T. Lanphier** manager of research.

Robert DeDobbelaere was named district sales manager in the midwest and southern area, Abrasives Div., **Elgin National Watch Co.**, Elgin, Ill.

Metal & Thermit Corp., New York, made **J. K. Parks** director of purchases and traffic and **G. B. Lederer** general purchasing agent.

Ford Motor Co. named four managers at its new Indianapolis manufacturing plant: **William J. Paynter**, production; **Jack V. Ketchman**, production control; **Harry R. Scott**, traffic, and **Donald Fraser**, quality control.

Granite City Steel Co., Granite City, Ill., elected **Nicholas P. Veeder** president; succeeding **George B. Schierberg**, president and treasurer, who will retire Sept. 1. **James L. Hamilton Jr.** was named executive vice president and general manager of sales, and **W. F. Hoelscher** secretary and treasurer.

Jacques P. Rhodes was promoted to purchasing agent, **Pennsylvania Transformer Div.**, Canonsburg, Pa., McGraw-Edison Co. Former assistant purchasing agent, he succeeds **Mrs. Lucy K. Packard**, retired.

Allied Products Corp., Detroit, elected **V. Leonard Hanna** treasurer and **Virgil P. Burgess** controller.

C. E. Ford was named to the new position of new products marketing manager by **National Carbon Co.**, division of Union Carbide Corp., New York.

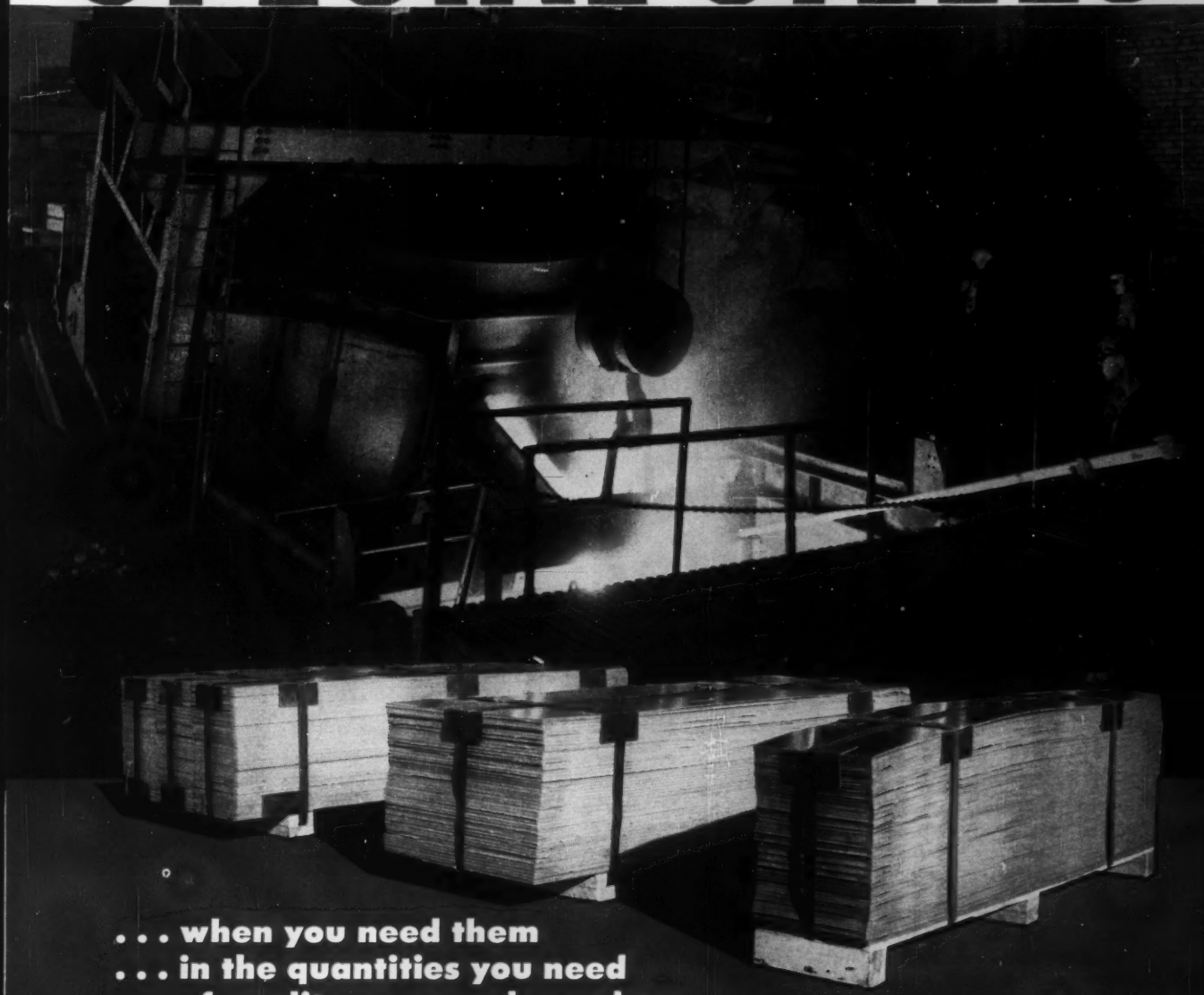
Richard H. Reiber was named Boston district manager, **U. S. Steel Supply Div.**, U. S. Steel Corp.

Robert W. Witchger was named chief inspector, **United States Graphite Co.**, Saginaw, Mich., division of Wickes Corp.

W. V. Dovenbarger was made superintendent of the processing department of the Zanesville, Ohio, Works of **Armco Steel Corp.**, Middletown, Ohio.

Jerome T. Coe was appointed manager of marketing, Silicone Products Dept., Waterford, N. Y., **General Electric Co.** Formerly sales manager, he succeeds **T. C. Ohart**

SPECIAL STEELS*



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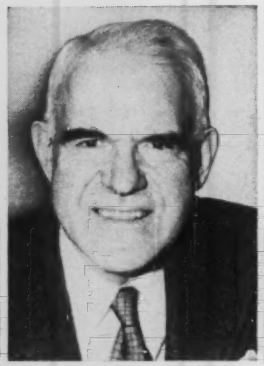
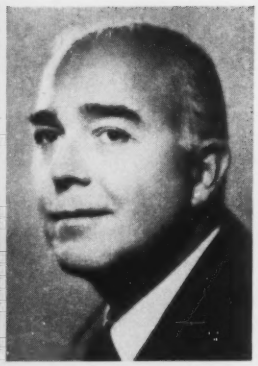
INGERSOLL STEEL
B-W
BORG-WARNER

Ingersoll STEEL DIVISION
Borg-Warner Corporation
New Castle, Indiana

EDWARD D. McDONALD
Madison Industries sales mgr.



DR. THOMAS H. JOHNSON
Raytheon research div. mgr.



JOSEPH F. O'HORA JR.
Mechanical Handling sales mgr.

DICK MOSHER
General Logistics sales post

G. E. SCHLOOT
Diamond Chain Co. president

RICHARD J. McDERMOTT
Warren Corp. plant mgr.

named general manager of General Electric's Insulating Materials Section.

General Logistics, Pasadena, Calif., named **Dick Mosher** industrial sales manager. He was with the parent company, Aeroquip Corp.

G. E. Schloot was elected president of **Diamond Chain Co. Inc.,** Indianapolis, succeeding **C. P. Kottlowski** who resigned because of ill health. He was vice president and personnel director.

Jerome L. McKinette was elected president and board chairman of **Burgundy Tool & Die Co.,** Chula Vista, Calif.

Lindberg Engineering Co., Chicago, named **Charles A. Mueller** chief engineer of its new gas process division.

Richard P. Immel was elected executive vice president and general manager, **American Limestone Co.,** subsidiary of American Zinc, Lead & Smelting Co., St. Louis.

Warren Corp. named **Richard J. McDermott,** vice president-production, as manager of its Clarion, Pa., plant, scheduled to open before fall.

Robert H. Adams was appointed vice president and sales manager of **Davison Steel Fabricators Inc.,** San Diego, Calif.

Westinghouse Electric Corp. named **B. W. Sauter** general manager of its Electronic Tube Div., Elmira, N. Y. He replaces **R. T. Orth,** vice president, resigned.

Angelo J. Grisetti was elected secretary of **Maintenance Inc.,** Wooster, Ohio.

New Jersey Zinc Co., New York, elected **Samuel Riker Jr.** secretary, succeeding **Walter R. Anyan,** deceased. He continues as treasurer.

Fageol Products Co., Kent, Ohio, named **A. G. Hilf,** vice president, as director of experimental development and testing.

Edward D. McDonald was made sales manager, **Madison Industries Inc.,** Muskegon, Mich. He was with Bendix Aviation Corp.

Dr. Thomas H. Johnson has been appointed manager-research division, **Raytheon Mfg. Co.,** Waltham, Mass. He has resigned as Atomic Energy Commission research director, effective Oct. 1.

Joseph F. O'Hora Jr. was named general sales manager, **Mechanical Handling Systems Inc.,** Detroit. Formerly manager of its Philadelphia district office, he succeeds **James R. Ewing,** resigned.

Long Mfg. Div., Detroit, Borg-Warner Corp., made **Daniel W. Lysett** director of sales; **William L. Pringle,** director of engineering; and **W. E. Rowe** director of manufacturing.

Charles A. Daly Jr. was made manager - general purchasing, **Radio Corp. of America,** New York. He succeeds **James B. Burke** recently named director, administrative services.

Frank E. Kolb was appointed manager, service division of the Chicago plant of **Joseph T. Ryerson & Son Inc.**

Peter B. Davies was appointed sales manager of the Equipment Div., **Proctor Electric Co.,** Philadelphia. He was with Philadelphia Gear Works Inc.

OBITUARIES...

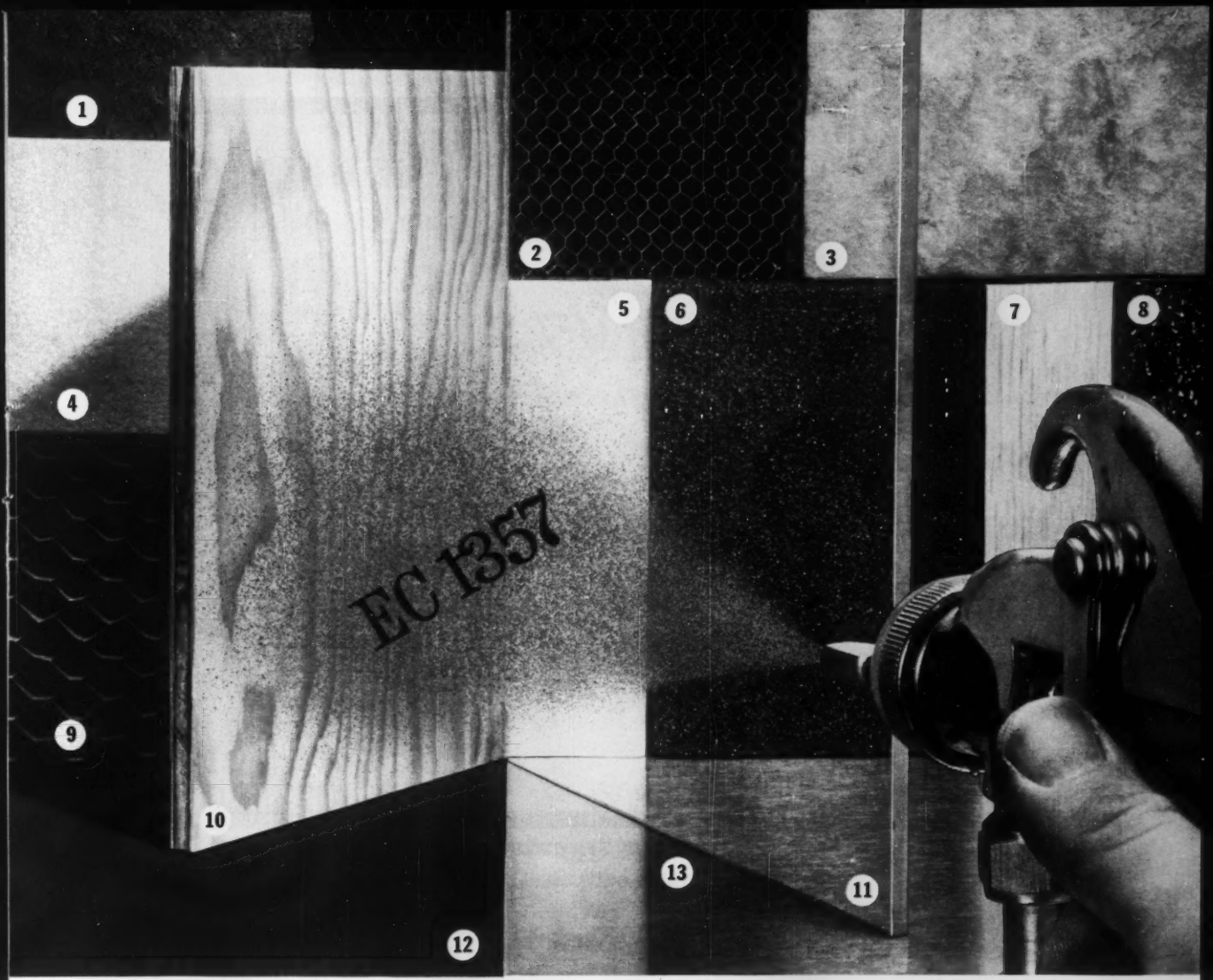
Louis Procurator, 57, executive vice president, **Robinson Bros & Co.,** Chicago, died Aug. 1.

Harold D. Arbuckle, 43, president, **A-B Steel Corp.,** Chicago, died Aug. 3.

Augustine J. Cunningham, 79, president, **James Cunningham & Son Co. Inc.,** Rochester, N. Y., died July 31.

Aaron L. Mercer, 68, former executive vice president of the old **Cleveland Tractor Co.,** Cleveland, died Aug. 6.

F. Ray Peterson, 55, assistant to the president, **R. G. LeTourneau Inc.,** Longview, Tex., died July 29.



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The union you get has great strength which increases as production continues, and resists moisture, high and low temperatures, weathering. For maximum immediate bond strength, EC-1357 may be force-dried through infrared exposure; or it can be dried at room temperature. All you need is a nip roller or cold press to bond sprayed surfaces. You save time and money. For load-bearing uses, look into 3M Adhesive EC-1177.

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DISTRIBUTORS IN THE PRINCIPAL CITIES OF THE WORLD

Alco Revamps Plant

Locomotive builder rearranging facilities at Schenectady at cost of more than $1 million

ALCO Products Inc., Schenectady, N. Y., has embarked on an extensive rearrangement of its manufacturing facilities in that city. The project is designed to give the company a more efficient locomotive manufacturing plant.

The initial phase of the program is scheduled for completion in December at a cost of more than $1 million. It calls for extensive modernization of three buildings: General welding shop, subassembly and truck shop, and miscellaneous machine shop. Subsequent rearrangement of work is scheduled.

Assemeby Line—All buildings affected by existing plans will be laid out so that materials flow into what is now the general welding shop. There, progressive-station assembly lines will move locomotives from the large, prefabricated assemblies through final painting.

The new facilities will replace the present locomotive erection shop which has been sold to Senoc Development Corp., Houston. Senoc also purchased one of the main structures in the company's ordnance plant. Disposition of the present locomotive assembly shop will be delayed pending completion of the new plant facilities.

J&L Opens Youngstown Office

Jones & Laughlin Steel Corp. opened a sales office at 45 S. Montgomery St., Youngstown, Ohio. Ronald E. Stillman is resident manager.

Moves Valve Operations

S. Morgan Smith Co. moved all valve operations from its R-S plant in Philadelphia to its main plant in York, Pa. In addition to improving the productive facilities, this phase of its expansion program is expected to lower manufacturing costs and shorten delivery time. Equipment involved in the move included: Two vertical boring mills, one horizontal boring mill, four radial drills, three milling machines, two large hydraulic valve test presses, eight lathes and various grinders, drills and other shop equipment.

Colson Building in South

Colson Corp., Elyria, Ohio, manufacturer of wheeled products for institutions and industrial material handling equipment, is constructing an 89,000 sq-ft plant for caster production in Jonesboro, Ark. It will provide an additional 80,000 sq ft of factory space. A 9000 sq-ft connecting structure will house administrative offices and other employee facilities.

Seattle Warehouse Organized

Summerville Steel Co. has begun operations at 1061 Sixth Ave. S, Seattle, Wash. The firm will warehouse and sell seamless and welded steel tubing, cold-finished bars, and tool and alloy steels. Officers are: President, Clyde Summerville; vice president, Jack Toland; secretary, Earl Anderson.

Completes Fabricating Plant

McGregor-Michigan Corp., Detroit, is completing construction of its new plant to house its entire steel plate fabricating and warehousing facilities. A section of the plant was erected in 1956 and the company's heavy fabricating work has been performed at the new location since that time. Offices will remain at 5818 Rivard St., that city.

Bearings Firm Expanding

Miniature Precision Bearings Inc., Keene, N. H., has outgrown the plant opened only a year ago. Ground has been broken for a 25,000 sq-ft addition which will increase production space by more than 50 per cent. Completion of the $300,000 addition is scheduled for Jan. 1.

Gets Welding Equipment Rights

National Cylinder Gas Co., Chicago, has obtained manufacturing rights to a Swiss machine that can weld standard railroad rails into continuous ¼-mile lengths in less than 2¼ hours.

New Saw Cuts Stainless Steel

Chicago Steel Service Co., Chicago, has installed a wet-process abrasive rotary saw to service stainless steel. The equipment handles plates up to 80 x 240 in. and as thick as 3 in. It enables the firm to furnish plates and bars cut to finished dimensions.

Equipment Builder Expands

Cleveland Fuel Equipment Co., manufacturer of combustion controls and instruments, has built a 4600 sq-ft addition to its plant at 1111 Brookpark Rd., Cleveland 9, Ohio. Plans are being prepared for a two-story building to be erected in front of this latest addition. Early this year, the firm doubled its original 10,000 sq-ft plant by purchasing an adjacent building.

Enters Subcontracting Field

Pullman-Standard Car Mfg. Co., Chicago, organized an industrial sales department for subcontract work on other than railroad equipment. James B. Rosser, vice president, will head up the department. The announcement was made by T. P. Gorter, vice president in charge of sales.

Black & Decker Opens Branch

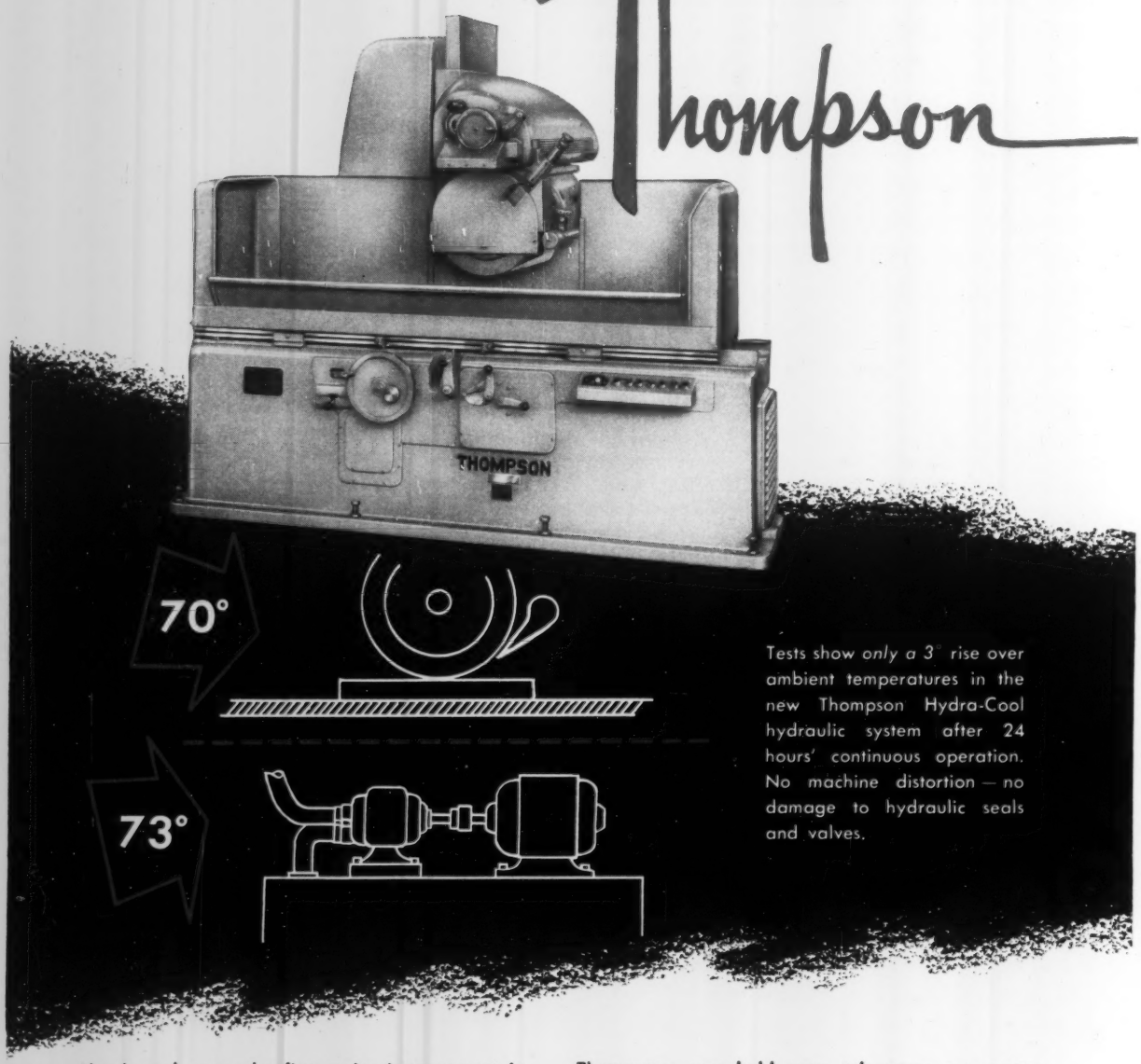
Black & Decker Mfg. Co., Towson, Md., opened a factory service and sales branch at 33 Webster St., Hartford, Conn. R. A. Wernsdorfer is the northeastern regional service manager; J. T. Tierney, Hartford branch service manager.

Firth Sterling Broadens Line

Firth Sterling Inc., Pittsburgh, is accepting orders for induction vacuum melted superalloys. Kolcast Industries Inc., a subsidary of Thompson Products Inc., Cleveland, is producing 500-lb superalloy ingots for Firth Sterling, as a result of a joint venture agreement consummated early this year. Ingots are converted by Firth Sterling at its McKeesport, Pa., plant into billets, centerless ground and hot rolled bars. In the near future, Kolcast will provide ingots up to

(*Please turn to Page* 138)

Thompson



Tests show *only a 3°* rise over ambient temperatures in the new Thompson Hydra-Cool hydraulic system after 24 hours' continuous operation. No machine distortion — no damage to hydraulic seals and valves.

Here's real news—the first major improvement in hydraulic surface grinding in the past 20 years.

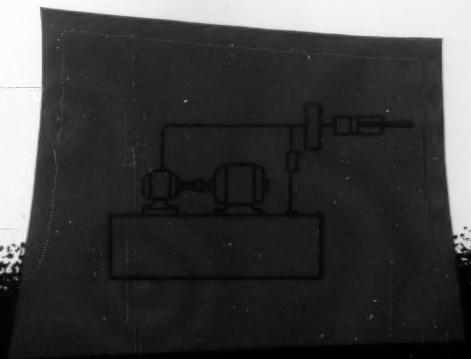
Heat, generated by continuous production grinding and constant hydraulic system operation, has long been a serious problem. General machine distortion, caused by extremes of temperature on top and bottom surfaces, has made close tolerances impossible to achieve. Excessive heat is destructive to the hydraulic system itself. Various and costly corrective measures have failed to solve this heat problem. Oil cooling and insulating devices have been only partially successful.

Now, the new Thompson Hydra-Cool system eliminates hydraulic heat *at its source*—with the new Thompsons, you hold your tolerances, no matter how close they may be or how long the run! Exhaustive tests have convincingly proved that, even after 24 hours of continuous operation, temperatures in the new Thompson Hydra-Cool hydraulic system have risen *only 3 degrees above ambient temperatures.*

To you, the new Thompson Hydra-Cool hydraulic system assures greater precision, less scrap loss, more trouble-free hydraulic operation—actual savings in dollars and cents! The new Hydra-Cool hydraulic system is available on all types of Thompson machines 40 inches and above in work length AT NO EXTRA CHARGE.

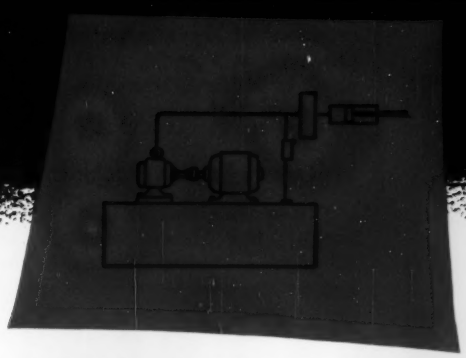
Again...THOMPSON LEADS IN SURFACE GRINDING ENGINEERING

— grinders eliminate hydraulic system heat

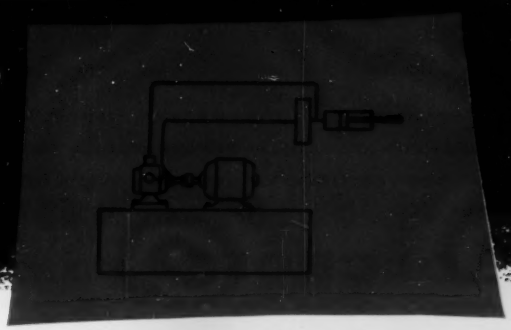


System No. 1—Constant volume hydraulic pump systems provide a continuous flow of oil for table reciprocation with pressures controlled by a relief valve set for greatest work need. Total pump volume circulates throughout the system continuously, generating heat even when the table is at rest. Oil coolers are a necessity on production work involving precision grinding.

WHICH TYPE OF SYSTEM WOULD YOU RECOMMEND?



System No. 2—Variable volume hydraulic systems regulate oil flow to the work requirement at adjustable rates, reducing oil flow through the system to only that volume necessary for each job. This limiting of flow through the system is an improvement over constant delivery systems but pressures within the system are still controlled by preset relief valve settings so that near constant pressures are maintained throughout the run. Oil coolers are also necessary for these systems.



The Thompson Hydra-Cool System*—New, pressure-compensating, variable delivery systems on new Thompson grinders control the rate of table movement and operating pressures automatically through a single hand lever control. As operator adjusts rate of table movement for the initial phase of each job, pressures within the system adjust automatically for the exact requirement to move the table smoothly and a constant speed. This modern pressure servo type system keeps HP input to the minimum. When the table is stopped, the pump ceases to pump oil. Hydraulic system heat remains at levels close to the ambient temperatures of the room. Distortion of the grinder bed is completely eliminated . . . at the source, without accessory cooling systems or expensive insulation methods. YOU GET THESE ADDED ADVANTAGES AT NO EXTRA COST.

*PATENT APPLIED FOR

MAIL THIS COUPON TODAY!

The Thompson Grinder Company ★ Springfield, Ohio, U. S. A.

Please send me your free booklet giving important facts on the new Thompson Hydra-Cool Hydraulic System.

NAME ..... TITLE .....

COMPANY .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

CONVAIR FURNACE-BRAZES B-58 HONEYCOMB PANELS

America's first supersonic bomber —the U. S. Air Force B-58 Hustler —on a test flight from the Fort Worth plant of Convair Division, General Dynamics Corporation.

When a bomber is designed for supersonic speeds as well as altitudes above 50,000 feet the combination of weight and strength becomes vitally important.

That's why Convair uses honeycomb "sandwich" construction for wing and fuselage panels. In producing these panels, honeycomb sections are placed in frames, faced with a silver-manganese alloy brazing foil, and then covered with skins. (Honeycombs, end closures, frames and skins are all of stainless steel.)

Assemblies are then loaded into a large alloy retort mounted on a furnace car and then travel through a brazing furnace installation designed and built by Holcroft. The result is a complete bond of all stainless steel parts.

Many manufacturers are taking a tip from the aircraft industry and are applying honeycomb construction to their own products. And more and more of these manufacturers are turning to Holcroft—not only for help in developing brazing systems but for all heat treating answers as well. You can, too. Just write.

HOLCROFT AND COMPANY

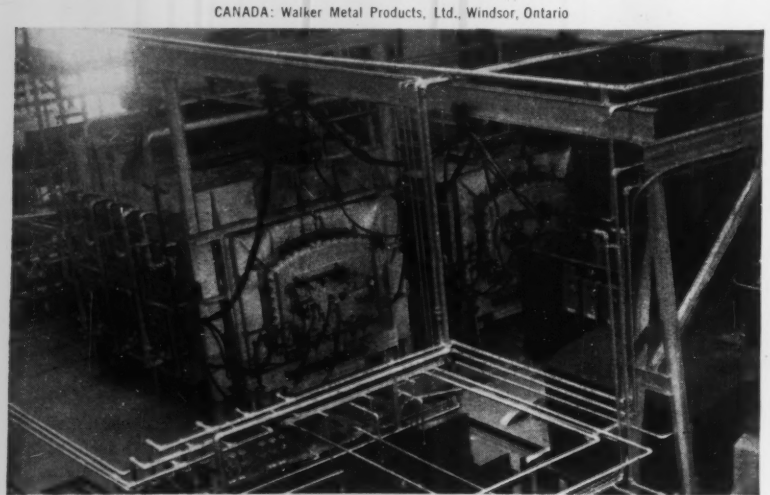
BUILT BY HOLCROFT & COMPANY DETROIT MICH

6545 EPWORTH BOULEVARD • DETROIT 10, MICHIGAN

PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

CHICAGO, ILL. • CLEVELAND, OHIO • HARTFORD, CONN. • HOUSTON, TEXAS • PHILA., PA.

CANADA: Walker Metal Products, Ltd., Windsor, Ontario



(*Concluded from Page* 135)

2500 lb in a variety of critical superalloys.

Starts Producing Steel Roofs

The newly formed Winbro Roof Division of Northern Indiana Steel Supply Co. Inc. is producing steel roofs for mobile homes. Headquarters are in the company's Michigan City, Ind., plant.

Waltham Watch Reorganized

Waltham Watch Co., Waltham, Mass., changed its name to Waltham Precision Instrument Co. and transferred its watch business to a new corporation, Waltham Watch Co. of Delaware.

Latrobe Opens Warehouse

Latrobe Steel Co., Latrobe, Pa., opened its southern regional warehouse and office at 4342 E. Tenth Court, Hialeah, Fla. It is devoted exclusively to tool and die steels and is under the direction of H. M. Givens, regional manager.

Bettinger Corp. To Build

Bettinger Corp., Waltham, Mass., producer of ceramic-coated metal products, will build a $1-million plant in Milford, Mass. It'll have 70,000 sq ft of space.

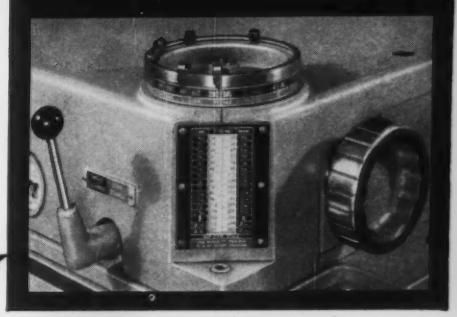
Will Make English Machines

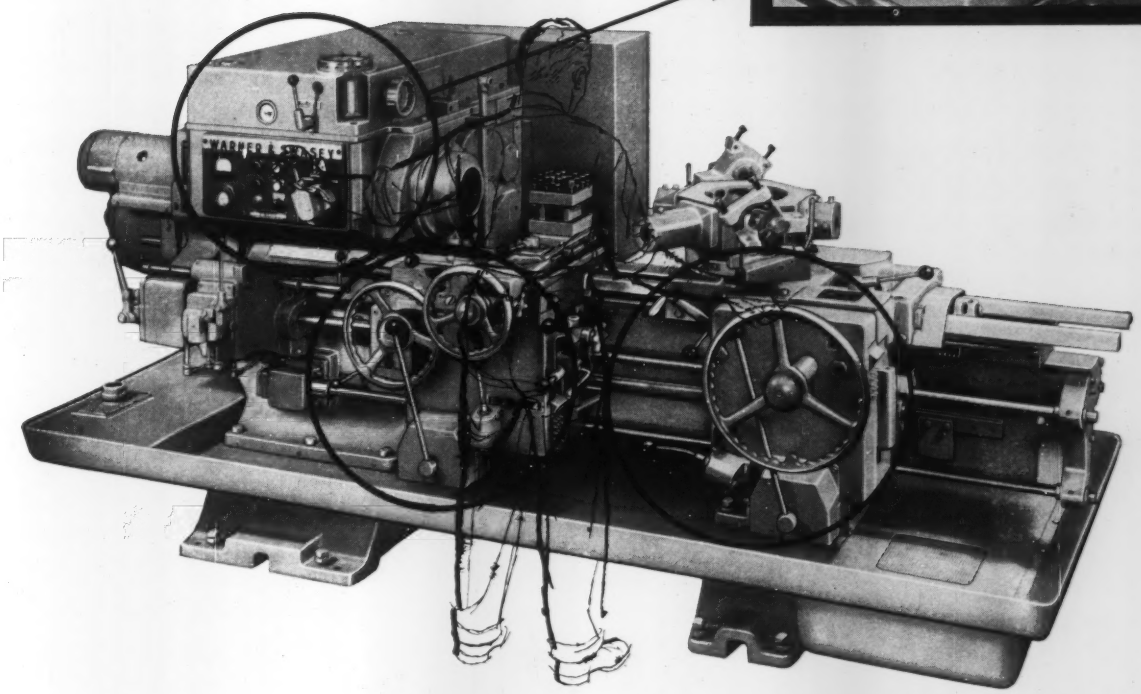
Sutton Engineering Co., Pittsburgh, has been licensed by Sir James Farmer Norton & Co. Ltd. of England to manufacture its centerless bar turning machines; rotary swaging machines; 2-roll bar straighteners and polishers; strip flattening and cutting machines.

Enters Storage Cabinet Field

Volkert Stampings Inc., Queens Village, N. Y., manufacturer of precision metal stampings for the electronics industry, established a division, Vidmar Inc., to produce drawer-type metal storage cabinets for industry. Vidmar will occupy a 44,000 sq-ft plant in Williamsport, Pa., which will be ready for occupancy by March, 1958. Operations are scheduled to begin

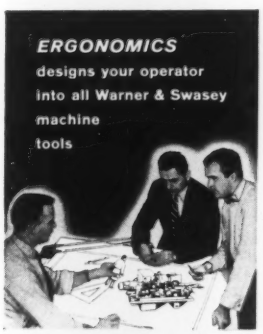
This exclusive Warner & Swasey Speed Preselector, heart of the "zoned controls" system, enables the operator to preselect the correct speed for each cut, with just a glance-and-a-twist of the knurled knob. Proper speeds are chosen for the required cuts on the job and then marked in sequence with numbered clips placed on the top of the chart drum. Just a touch of the lever instantly shifts the machine to the next desired speed.





Warner & Swasey "ZONED CONTROLS"

boost production by helping increase operator efficiency



Known throughout industry as "the operator's machine", Warner & Swasey turret lathes are painstakingly designed with the human element in mind. They provide easy-to-handle operating controls, compactly arranged at convenient levels that minimize stooping and reaching — all of which contribute to increased operator satisfaction and higher production. Heart of the "zoned controls" system is Warner & Swasey's exclusive Speed Preselector — calibrated in surface feet and spindle RPM's versus work diameters — that encourages operator use of the proper spindle speeds for the particular job being machined. Additional single lever control features praised by operators include: A fast, simple change for spindle speeds; apron feed levers with "feel" control; four-way carriage rapid traverse; easy operating turret units and hydraulic collet chuck and bar feed control. For more detailed information about the adaptability of Warner & Swasey turret lathes to your particular machining problems, call in our Field Representative, today.

WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS...WITH A WARNER & SWASEY

Hydrocrane Outriggers Supply SOLID FOOTING for Your Crane . . . and Your Profits

Four patented hydraulic outriggers are the keys to one of the Hydrocrane's outstanding profit-making abilities.

Here are four legs of steel that extend and set in seconds at the touch of a lever, leveling the crane hydraulically . . . even on rough, uneven ground. This stability permits the Hydrocrane to handle the big lifts fast, easily, safely — more profitably.

With these outriggers the Hydrocrane does the work of bigger cranes, yet it is mounted on a mobile new or used commercial truck. On many jobs, the Hydrocrane has doubled crane production just by working while other slower machines were still traveling between lifts.

Put profit in your pocket . . . get the crane that wastes less time getting to work and does a better job when it arrives. See the 10-ton H-5 Hydrocrane or the 5-ton H-3 . . . your Bucyrus-Erie distributor will arrange the details.

212H57

BUCYRUS ERIE HYDROCRANE

Bucyrus-Erie Company

SOUTH MILWAUKEE, WISCONSIN

next May. The plant will be under the management of C. W. Miller.

Byers Grants Conduit Rights

National Electric Products Corp. has been granted exclusive finishing and marketing rights to A. M. Byers Co.'s wrought iron electrical conduit. Headquarters of both firms are in Pittsburgh.

Polymer Licenses Bearing Firm

Polymer Processes Inc., subsidiary of Polymer Corp., Reading, Pa., licensed Barden Corp., Danbury, Conn., to manufacture ball bearing retainers from Nylasint, a finely divided nylon powder.

Louis Allis Opens Branch

Louis Allis Co., Milwaukee, opened a sales office at South Bend, Ind., under the managership of Carl Kowal. In other personnel shifts, Donald Thomas was named district manager at St. Louis; Robert Brodd, at Kansas City, Mo. The firm makes motors, generators, and other electrical equipment.

Erie, Pa., Firm To Build

Parker White Metal Co., Erie, Pa., will soon start building a one-story plant in the Fairview sector of Erie. The 65,000 sq-ft facility will house part of the company's manufacturing operations, including zinc diecasting.

Instrument Firm Expanding

Beckman Instruments Inc., Fullerton, Calif., will expand the Spinco Division plant in Palo Alto, Calif. The division makes specialized instrumentation for medical research.

M-H Valve Division Moves

A $1.5-million plant for the production of industrial valves for automation and the expanding missile program was opened last month in Ft. Washington, Pa., by Minneapolis-Honeywell Regulator Co., Minneapolis. The 120,000 sq-ft plant provides manufacturing, research and development, sales, and administrative facilities for

BRAINARD HEAVY DUTY STRAPPING

INTEGRATED PRODUCTION . . . . . Assures Constant Supply

As a division of Sharon Steel, Brainard's integrated production insures a constant supply of Heavy Duty Strapping in all heavy duty sizes and gauges:

1¼" by .035, ¾" by .035, 2" by .050, 1¼" by .050, and ¾" by .028.

and that's not all . . . BRAINARD

NEW PNC HEAVY DUTY TOOL

Pneumatic Heavy Duty Strapping Tool, first of its kind. Rugged, light weight, and portable, this power tool insures uniform tension on each band. Power does the work and eliminates operator fatigue. Specially designed for use on pallets, skids, and sheet steel.

BRAINARD STEEL STRAPPING DIVISION
WARREN OHIO

I would like more information about Brainard's Heavy Duty Strapping and the PNC.

NAME_____

COMPANY_____

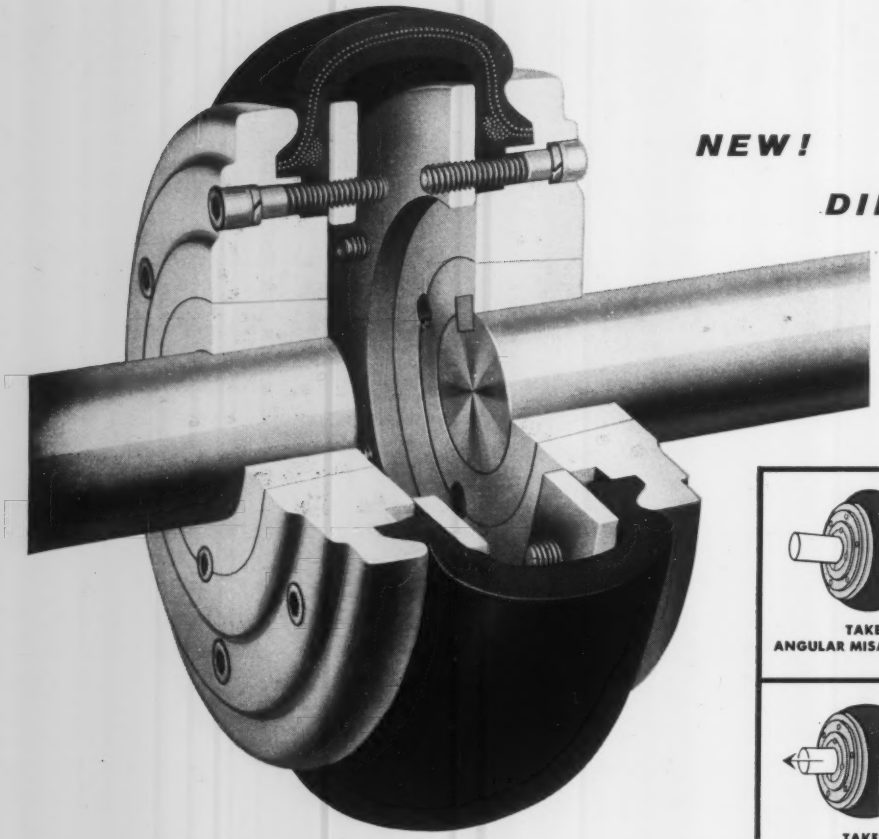
ADDRESS_____

TITLE_____

Brainard Steel Strapping

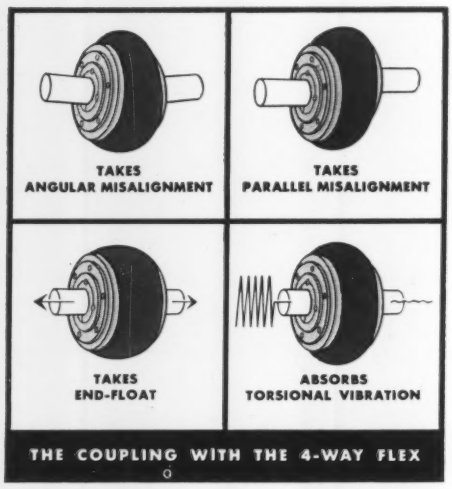
SHARONSTEEL

Brainard Steel Division, Sharon Steel Corporation
Griswold Street, Warren, Ohio



NEW!

DIFFERENT!



Announcing

Para•flex

FLEXIBLE CUSHION COUPLING

THIS coupling "swallows up" shaft misplacements. It automatically compensates for end-float, parallel misalignment, angular misalignment *or any combination of all three.* Moreover, it cushions the stresses of shock loads. And it absorbs torsional vibration—reducing noise and protecting machinery from vibration's destructive forces.

Here is a new type of performance—made possible by the development of a tire-like flexing element. Synthetic tension members, bonded together in rubber, give this element the stamina and dependability of modern, high-speed, high-load, shock-absorbing truck tires—and the ability to respond magically to all manner of changing shaft conditions.

Para-flex takes minimum space on the shaft. Mounting is simplified through the use of standard Taper-Lock bushings—no reboring, no machining. Safety is promoted by flush design; there are no protruding parts. No lubrication is required, no periodic inspection. And since the flexible member is molded with a transverse split, it can be replaced *without moving either the driver or driven machine.*

Para-flex Couplings are stocked by Dodge Distributors in popular transmission sizes. They are available from factory stock in capacities up to 600 hp at 900 rpm. Call your distributor for early delivery to *make your own test.* You'll witness something revolutionary!

DODGE MANUFACTURING CORPORATION, 4400 Union, Mishawaka, Ind.

DODGE

of Mishawaka, Ind.

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new methods. Look for his name under "Power Transmission Machinery" in the yellow pages of your classified telephone directory—or write us.

the firm's Valve Division. Machinery and other equipment is being transferred from the old site on Broad Street, Philadelphia.

Enters Mechanical Press Field

Hydraulic Press Mfg. Co., a division of Koehring Co., Mt. Gilead, Ohio, acquired Henry & Wright Division of Emhart Mfg. Co., Hartford, Conn. The purchase permits H-P-M to enter the mechanical press field.

Fruehauf Broadens Research

Fruehauf Trailer Co., Detroit, has established a research and development engineering department in its Missile Products Division. The department will be at 19241 Mack Ave., Detroit, under the supervision of R. K. Maddock, chief engineer. J. J. Bohmrich heads the Missile Products Division.

Longren Aircraft Expands

Longren Aircraft Co. Inc., Torrance, Calif., completed an 80,000 sq-ft addition to its 46,000 sq-ft plant.

Calidyne Building Plant

Calidyne Co., maker of vibration test equipment, is building a 46,000 sq-ft plant in Woburn, Mass. Estimated cost: $500,000.

Fabricators Open in Richmond

Houck & Greene Steel Co. has been established at Richmond, Va., to fabricate structural and reinforcing steel and to distribute steel products. Officers are J. R. Houck, president, and R. D. Greene, vice president.

Hotpoint Plans Expansion

In the near future, Hotpoint Co., Chicago, plans to build a refrigerator compressor plant on a 770-acre tract in Elk Grove, Ill. Pilot production is scheduled for early 1959. Other plants and buildings for the site are in the planning stage and will be added as market needs develop during the next five to ten years. Hotpoint is a division of General Electric Co., Schenectady, N. Y.

Clark Bros. Opens Warehouse

Clark Bros. Co., Olean, N. Y., opened office and warehouse facilities at 800 Central Expressway, New Orleans, La. This division of Dresser Industries Inc. makes compressors and gas turbines. John Cooper is branch manager.

Distributor To Build

Howard Supply Co., distributor of steel products, will build a 15,000 sq-ft addition to its warehouse at 5125 Santa Fe Ave., Los Angeles, Calif.

Meter-Mix Offers New Line

Meter-Mix Corp., Boston, is now handling the design, manufacture, and sale of the proportional metering, mixing, and metered dispensing systems formerly supplied by Applied Engineering Associates, New York. Meter-Mix will operate as a division of the Federal Machine Tool Co., manufacturer of precision equipment, Bristol, Conn.

CONSOLIDATIONS

Ohio Electric Mfg. Co. acquired **Homer Mfg. Co. Inc.**, Lima, Ohio, manufacturer of permanent magnetic equipment. Ohio Electric produces electromagnets and electric motors at its plants in Maple Heights, Ohio, and North Plainfield, N. J.

Buffalo Tank Corp., Buffalo, purchased **Virginia Steel Co.**, Richmond, Va., fabricator of reinforcing steel and manufacturer of steel joists. Buffalo Tank is a subsidiary of Bethlehem Steel Co., Bethlehem, Pa.

Mendon Research & Development Co., Mendon, N. Y., will acquire National Brass Mfg. Co., Rochester, N. Y., and will move the business to its subsidiary, Ashley Machine Works, Rochester. National Brass makes faucets, valves, and special fittings.

DeVilbiss Co., Toledo, Ohio, is purchasing **Newcomb-Detroit Co.**, manufacturer and installer of cus-

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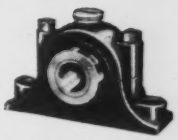
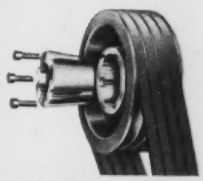
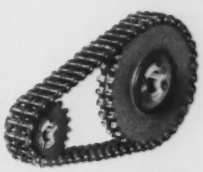


DODGE-TIMKEN
America's Quality Pillow Blocks!



TAPER-LOCK
SHEAVES
Easy on — easy off! Mount flush!



TAPER-LOCK
SPROCKETS
No reboring — no waiting!

Write for Bulletins!

- Roller Bearings. Load ratings, dimensions, etc. Bulletin A-638.
- Taper-Lock Sheaves. Drive tables and technical data. Bulletin A-661.
- Taper-Lock Sprocket and Dodge Roller Chain data. Bulletin A-644.

DODGE MANUFACTURING CORPORATION
4400 Union Street • Mishawaka, Indiana

DODGE
of Mishawaka, Ind.

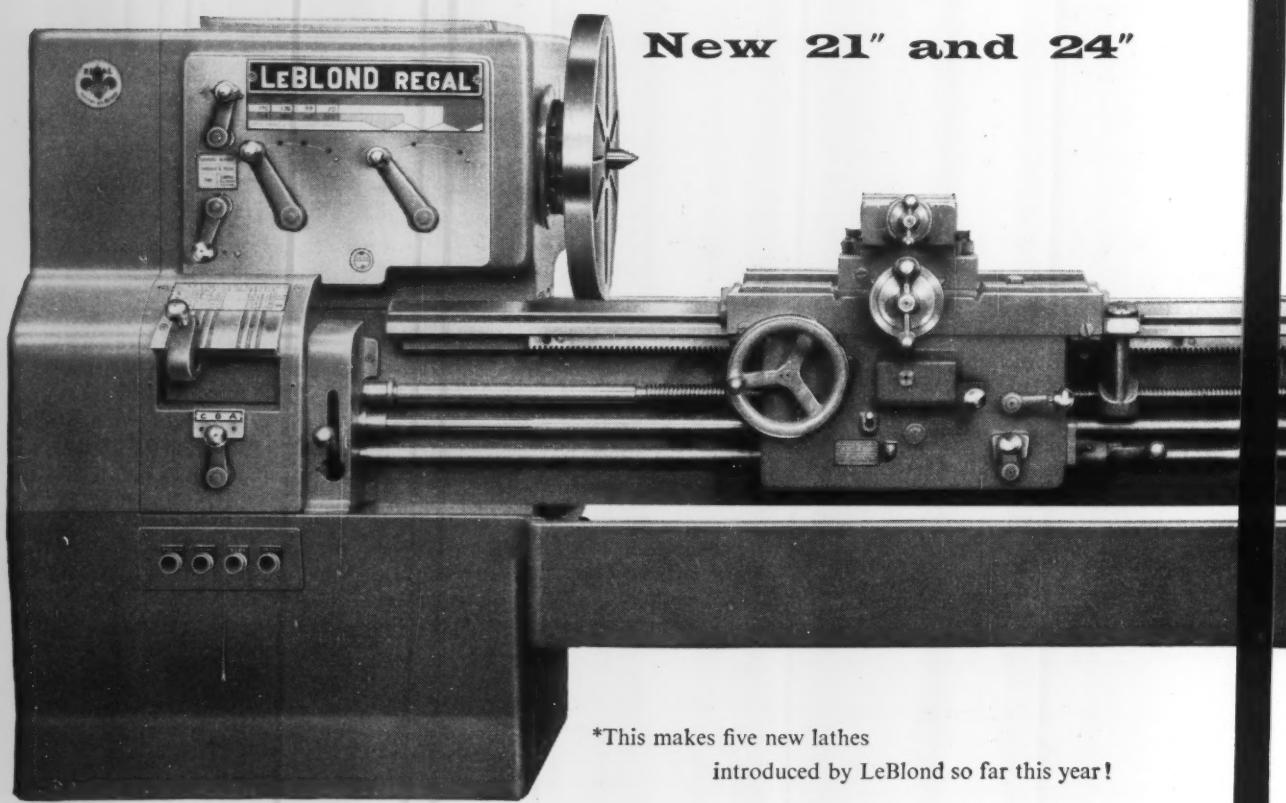
TWO MORE* ALL

The new 21″ and 24″ LeBlond Regals give you capacity, speeds and horsepower you'd find in more expensive heavy type machines offered by other builders—and at one of the most attractive prices LeBlond has ever offered!

Here's the rundown. Standard 7½ HP, optional 10 HP for high speed ranges in both models (see chart); electric clutch and brake; feed reverse at the apron; heat-treated gears in head, quick-change box and apron—plus all the famous big-lathe features that have made LeBlond Regals production favorites from coast to coast.

Headstock uses the same combination gear-belt drive construction that proved itself on the famous LeBlond Dual-Drive and is now incorporated on our new 16″ heavy-duty lathe. Bed has hardened and ground replaceable steel ways like the ways on our larger machines. They are fitted according to the compensating

TWO MORE* ALL



New 21″ and 24″

*This makes five new lathes
introduced by LeBlond so far this year!

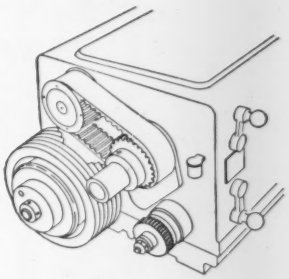
NEW LeBLONDS

veeway principle to insure better distribution of forces for proven long-time accuracy and minimum wear.

Again, like higher-priced lathes, Regals are equipped with both feed rod and preloaded precision leadscrew for continued accuracy in thread chasing. Other big-lathe features— 3 bearing spindle. Automatically-lubricated quick-change box. Wide carriage bridge with ample bearing surface. Rugged tailstock with plug clamping. In addition, you get general dimensions and construction details patterned after LeBlond heavy-duty engine lathes.

All of LeBlond's 70 years of experience has gone into the design and building of these new Regals. Only from the builder of a complete line of lathes can you get a low-priced lathe with all these big-lathe features. Get full details on the new 21″ and 24″ LeBlond Regal Lathes. See your LeBlond Distributor or write—Ask for Bulletin R-205G.

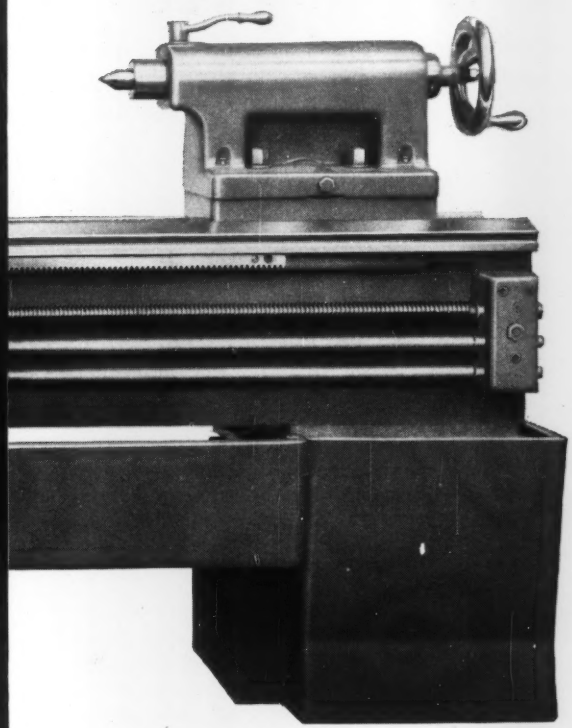
NEW LeBLONDS



Exclusive LeBlond

Combination Gear-Belt Drive

Regal lathes deliver up to 10 H.P.!



STANDARD AND OPTIONAL SPEED RANGES 21″ and 24″ REGALS	
12 Standard Speeds:	
Gear Drive	*18, 25, 35, 49, 70, 98, 136, 192 rpm.*
Belt Drive	*260, 362, 510, 720 rpm.*
12 Optional Speeds:	
Gear Drive	*27, 38, 53, 74, 105, 146, 204, 288 rpm.*
Belt Drive	*390, 544, 765, 1080 rpm.*

. . cut with confidence

THE R. K. LeBLOND MACHINE TOOL COMPANY

Cincinnati 8, Ohio

LeBLOND of Cincinnati

World's Largest Builder of A Complete Line of Lathes for More Than 70 Years

Look at your finishing method—will automatic painting pay off?

Here's how to find out . . . in advance

Before you invest a cent in finishing equipment, DeVilbiss will put your product or component part through a series of trial runs on already-installed automatic spray equipment. The results of these trial runs in the fully equipped DeVilbiss Laboratory will determine the actual unit rate production, material consumption, film build attainable, and over-all quality of the finish. Thus, you'll know in advance what economies, if any, can be derived by setting up new facilities, or converting your present operations to a fully proved DeVilbiss system for completely or semi-mechanized spray finishing.

We'd like to help you. Call our nearest representative, or write us direct. The DeVilbiss Company, Dept. 460, Toledo 1, Ohio

THE DEVILBISS COMPANY
Toledo 1, Ohio

San Jose, Calif. • Barrie, Ontario
London, England
Branch Offices in Principal Cities

FOR BETTER SERVICE, BUY
DEVILBISS

DEVILBISS HELPS YOU GET THE *MOST* FROM THE SPRAY METHOD

(Concluded from Page 143)

tom-built, industrial finishing equipment. Newcomb-Detroit has plants in Detroit and Grand Rapids, Mich.

Stewart-Warner Corp., Chicago, acquired **National Governor Co.**, Oak Park, Ill., manufacturer of speed governors for trucks and industrial engines. National Governor business will be incorporated into the operations of Stewart-Warner's Alemite & Instrument Div.

American Seal-Kap Corp., Long Island City, N. Y., through its subsidiary, **Hardwick Hindle Inc.**, Newark, N. J., acquired the **George Rattray & Co. Inc.**, Richmond Hill, N. Y., manufacturer of precision potentiometers.

Mississippi Valley Structural Steel Co., St. Louis, purchased two companies in Lansing, Mich.: **Jarvis Engineering Works** (fabricating firm) and **Jarvis Erection Co.** (erection organization).

NEW ADDRESSES

Precision Castparts Corp. (formerly Omark Industries) moved into its new plant at 4600 S. E. Harney Drive, Portland 6, Oreg.

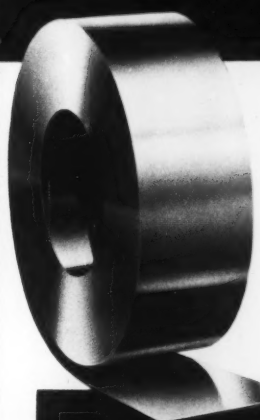
Chicago Eye Shield Co. moved to 2727 W. Roscoe, Chicago 18, Ill. The new quarters give the company at least 50 per cent more productive capacity.

ASSOCIATIONS

Wire Reinforcement Institute, Washington, elected these officers: President, W. G. Stoughton, Pittsburgh Steel Co., Pittsburgh; vice president, E. C. Planett, Planett Mfg. Co., Downey, Calif. Managing director of the organization is Frank B. Brown.

Louis F. Fontana, Irving Subway Grating Co. Inc., Long Island City, N. Y., has been re-elected president of the **National Association of Architectural Metal Manufacturers**, Chicago.

SUPERIOR



bright-annealed

or

hardened and tempered

STAINLESS STRIP STEEL

Made in our new, bright heat-treating furnace — in widths up to 20 inches, and in thicknesses from .015″ to .065″. Write for quotations on your requirements.

Superior Steel
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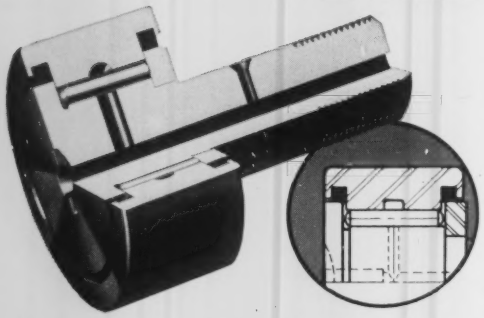
OUTLOOK TEC
TECHNICAL OU

BEARING TIPS by McGill

sealed CAMROL® bearings lock out contamination in critical cam follower applications

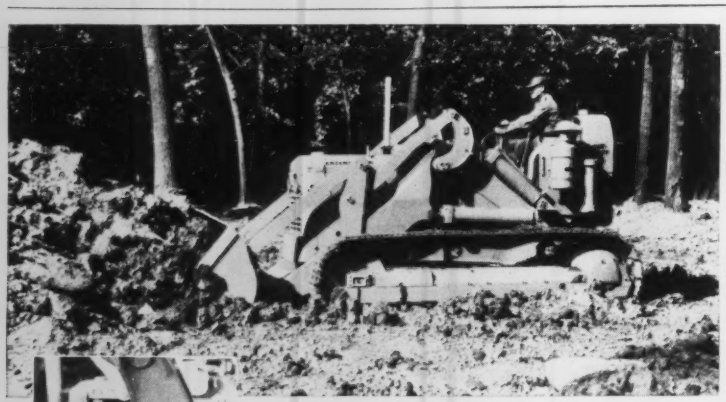


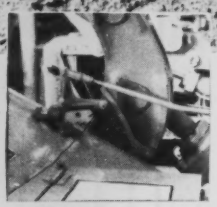
The new SCF series of the famous CAMROL cam follower completely seals out dirt, chips, moisture, etc. — an important advantage where the life of an ordinarily open mounted cam follower can be materially increased with adequate protection against contamination. Also the sealed bearing is pre-lubricated with provision made for easy re-lubrication, if desired, through either end of the stud.

Specially treated synthetic seals are contained in the outer race undercuts over the stud flange and roller retaining washer. For added protection, all external surfaces of the bearing are treated to provide a corrosion resistant, black ferrous oxide surface.

These same advantages are available in the SCYR sealed series Cam Yoke Roller (without stud). Specify CAMROL bearings with the built-in seals that preserve cam follower dependability in critical cam action, support or track roller application.

Now Sealed and Prelubricated

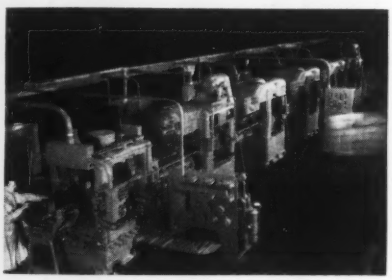




Built-in seals protect and preserve CAMROL® bearings from contamination in CATERPILLAR tractor-shovels

McGill SCF series sealed CAMROL bearings provide the cam action that positions the bucket of the 977 Traxcavator unit at the selected digging angle. Mounted on bell crank arms that are actuated by contact with a cam shoe on a hydraulic cylinder, these bearings are operating in the open and exposed constantly to dust, dirt and moisture. External surfaces have a black ferrous-oxide finish to prevent corrosion. These sealed McGill cam followers eliminate the need for relubrication and maintenance after installation. Caterpillar uses other McGill bearings including twelve CYR series cam yoke roller bearings in the flywheel clutch.

378 sealed CAMROL® bearings guide engine blocks in INGERSOLL automatic milling machine



The sealed CAMROL bearings used in this machine, guide cylinder blocks during transfer through various milling, boring and drilling operations. The bearings, used in place of guide bars, eliminate surface scratching of the 200 to 300 pound blocks which are transferred at speeds up to 400 feet per minute. Blocks are processed at the rate of 95 per hour. Ingersoll reports freer movement, accuracy of positioning and materially longer bearing life due to the new design that seals metal chips out of the bearings.

Insure performance with McGILL®

MULTIROL® GUIDEROL® CAMROL®
Precision Needle Bearings

McGILL MANUFACTURING COMPANY, INC., 301 N. LAFAYETTE ST., VALPARAISO, INDIANA

STEEL
August 19, 1957

Technical Outlook

SLAB STAMPER—The new slabbing mill at Republic Steel Corp.'s Cleveland Works will have a mechanical marker capable of stamping as many as 16 digits and symbols on the slab. Information on heat number, slab size, crop location, ingot weight, and slab weight can be impressed at one blow of the machine, which will be located at the end of the runout table, just before the slab pilers. It is being made by M. E. Cunningham Co., Pittsburgh.

GOLD PLATING—It can be done by a new electroless process (no current needed) developed by Metal Processing Co., Cedar Grove, N. J. On polished nickel, the gold is bright and adhesion is good.

STELLITE FOR GAS TURBINES—Turbine wheels for the Ford Motor version of tomorrow's automotive power plant are investment cast from Haynes alloy No. 31 and Multimet. They operate between 23,000 and 35,000 rpm and withstand temperatures up to 1600° F. Close tolerances in the casting method reduce machining of the tough metal. Ford is considering the gas turbine initially for trucks and buses.

MORE POWER TO COMPUTERS—General Electric's jet engine plant at Cincinnati has what is said to be industry's most powerful computer. Capacity: 32,768 words of information; data can be put into or taken out of the machine in 12 millionths of a second.

DUCTILE IRON—Tests conducted at the Boston Works of the Walworth Co. showed that ductile iron valves have a thermal shock resistance equal to steel valves. A group of visiting refinery engineers watched a demonstration in which a 6-in. valve was heated to 1350° F, then water quenched. It retained its shape and dimensions. Walworth officials say the tests answer questions of safety in case of fire in piping systems using ductile iron valves.

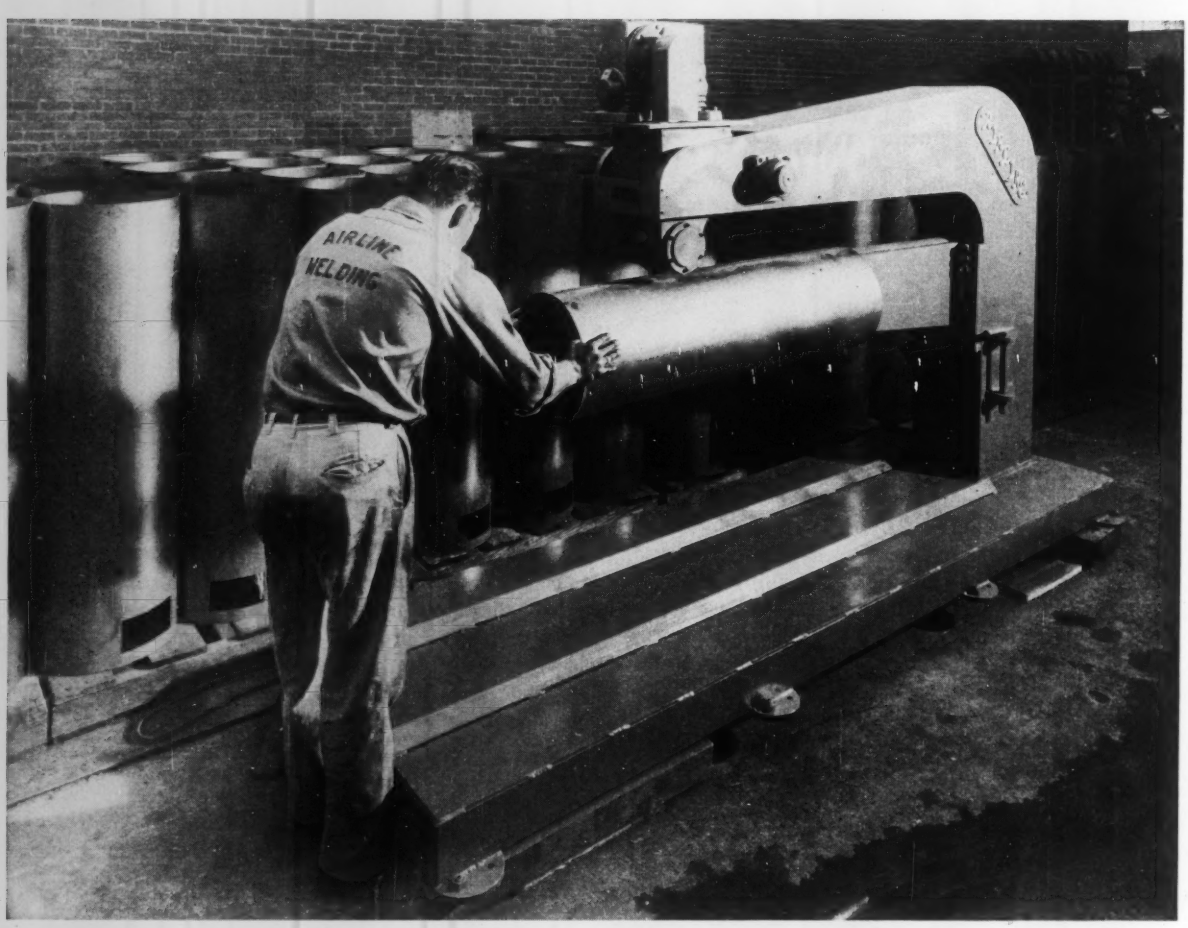
STRONGER CONDUIT—Youngstown Sheet & Tube Co., Youngstown, is producing conduit and electrical metallic tubing in its Yoloy (high strength, low alloy) steel. Corrosion resistance is four times better than carbon steel. Greater strength of the products enables them to resist damage from accidents and rough use. Bends do not flatten on the outside radius as much as they do in metals of lesser strength.

MOLY TUBE—Molybdenum, a difficult metal to hot work, is being successfully extruded by Wolverine Tube Division of Calumet & Hecla Inc. The tubing is available in diameters of less than 1 in. and 3 to 6 ft lengths. It is stronger than other metals at temperatures above 1700° F, and resists corrosion by liquid metals. Tensile strength is 70,000-100,000 psi, yield strength 60,000-90,000 psi.

RESEARCH RESULTS—These findings were reported recently at the 10th anniversary of the founding of the Fulmer Research Institute (England):

- Silicon-aluminum steels may be as effective as stainless steel in resisting oxidation at high temperatures; they should prove useful for heat exchangers.
- Cast bearings of aluminum with 30 per cent tin have good mechanical properties and high fatigue strength. A method has been developed for bonding the alloy to steel.
- Aluminum alloys containing a small amount of cadmium have mechanical properties similar to the well known duralium type alloys. However, they are easier to fabricate and have improved stress corrosion properties.

Metalworking Outlook—p. 101 Market Outlook—p. 235



Planisher cold working a fusion weld in a water heater shell. Upper roll is powered; lower one idles. Pressure is regulated by air. This machine has a 60-in. throat

Planisher Shaves Weld Costs

It rolls welds flat, improving physical properties and quality. Machinemaker says the method virtually eliminates filler metal in sheets up to 0.093 in. thick

THE operator in the illustration above is roll planishing a fusion weld in a water heater shell.

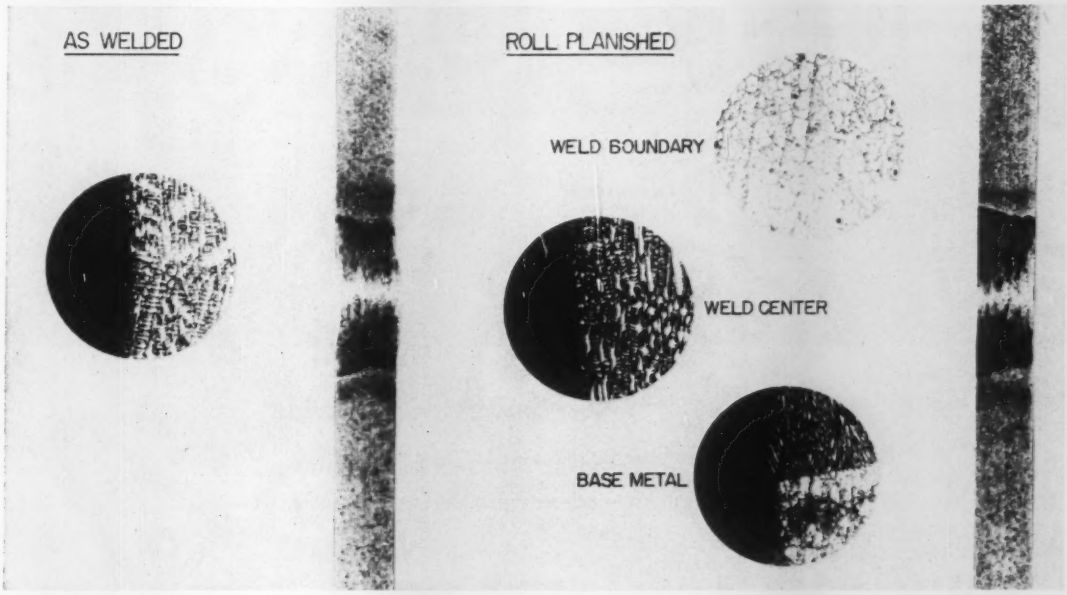
It's one of the best ways to cut the cost of inert gas shielded, tungsten arc (Tig) welding, says Airline Welding & Engineering, Hawthorne, Calif. It eliminates the need for filler wire.

Here's a brief outline of how the method works:

What It Is—Roll planishing is controlled cold working. It improves the physical properties of a fusion weld while it smooths and flattens.

A planisher uses opposed rolls to compress the weld. The upper roll is driven; the lower one is a follower or idler. A pneumatically powered arm varies the amount of pressure.

When It's Used—The Tig weld is best for simple objects (cones, cylinders, boxes, and tubes) made of aluminum, stainless, titanium, superalloys, and low carbon or medium alloy steels, says Airline



Here are cross sections and photomicrographs of Nimonic 75 Heliarc welded without filler metal. Note that surfaces are flush; grains are somewhat smaller at center

Welding. It works best on sheets which are from 0.005 in. to 0.093 in. thick.

The simplest joint is a square butt. Welders normally apply filler metal in making them.

Three types don't require a filler: Square butt, corner, and standing edge. However, they must satisfy these requirements: 1. Weld thickness and joint strength must be equal to those of the base metal. 2. The weld must be smoothed by some method other than grinding or machining.

Roll planishing satisfies those conditions.

How It's Done—The disadvantage of fusion without filler metal is the lack of a traditional weld reinforcement—the arc side of the joint is generally concave and the root side convex.

Planishing pushes the drop-through back into the weld joint.

Roll shape depends on the part. Thin-walled cylinders and cones, for example, require an upper roll with a flat contact surface and a lower roll with a convex area.

The illustration (above) shows how a weld in Nimonic 75 looks before and after planishing.

Effects—Comparison of regular and roll planished welds points up the improvements of cold working. Planished Nimonic 75 samples showed that tensile failure always occurred outside the weld joint in the base metal. There was no significant difference between planished and unplanished specimens in ultimate tensile strength; yield strength increased about 2500 psi. Elongation across the weld joint decreased 62 per cent.

In Type 316 stainless, similar tests pointed out that joints as-welded were considerably weaker than the base metal; tensile failures always occurred at the center of the weld along the center line shrinkage zone. Elongation across the weld was 12 per cent greater than that of the base metal. It was not due to a thinner cross-sectional area.

Roll planishing increased stainless tensile strength 3000 psi. Contrary to the Nimonic tests, elongation in 2 in. increased 29 to 48 per cent. The reason: A 13 per cent drop in elongation across the weld metal spread stress more evenly through the base metal. All failures occurred in the base metal.

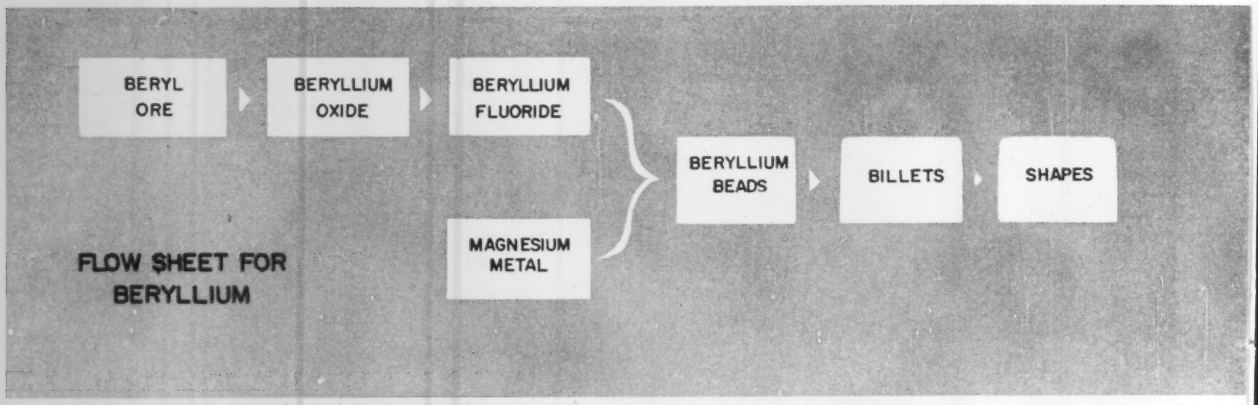
Comparative Costs of Making This Cone

Method	Cost per inch
Fusion weld and roll planish	$0.025
Fusion weld with filler wire	0.058

Material: 3/32-in. stainless steel

Quantity: 100

Note: Filler wire cost includes grinding and polishing.



Beryllium Takes New Step

The first privately owned plant to make beryllium on a large scale goes on stream this month. Immediate uses will be in reactors; structural applications are expected to follow

BERYLLIUM is ready to move out on its own and take on an important role in atomic power reactors. Up to now it has been used chiefly in making alloys (primarily beryllium-copper).

Its great atomic value comes from the fact that it's an excellent moderator (slow down fast neutrons) and reflector (reduces neutron losses).

Anticipating nuclear needs, in September, 1956, the Atomic Energy Commission contracted for 1 million lb of beryllium metal at about $47 per pound—delivery to be made over a five-year period.

Start — On July 30, Beryllium Corp. unveiled its new $4.5 million Nuclear Division plant at Hazleton, Pa., which will supply half of AEC's requirements. (Brush Beryllium Co., Cleveland, will supply the other half.)

Described by Beryllium Corp.'s president, Walter R. Lowry, as "the first privately owned plant for the large scale manufacture of metallic beryllium," the facility went on stream early in August.

Deliveries will start in the fourth quarter. The plant will produce 100,000 lb a year for AEC, with some to spare. The company also expects to supply metal to private industry.

How It's Made—The flow sheet above shows the steps used to extract the metal from its ore. The beryl ore which Hazleton will use consists of about 11 per cent beryllium oxide with about 19 per cent aluminum oxide and 68 per cent silica.

The ore is crushed and ground to small particles, then treated with chemicals to convert its beryllium oxide content to a sodium beryllium fluoride complex. This is water soluble; the aluminum and silicon oxides are insoluble and are left behind.

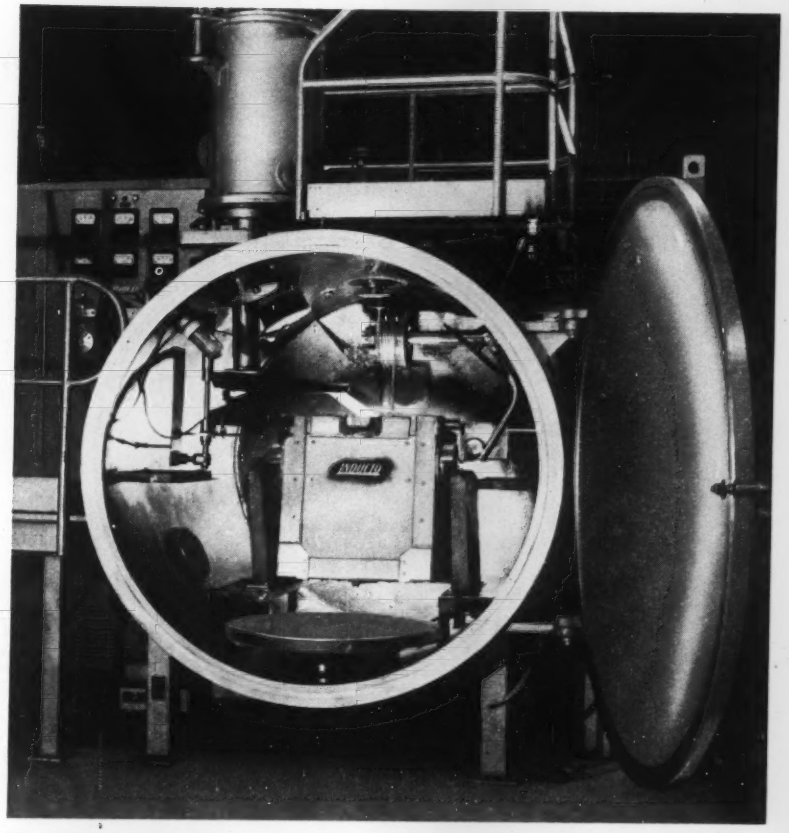
The insolubles are filtered off, and the beryllium in solution is treated to precipitate insoluble beryllium hydroxide which is converted to the oxide by drying.

Because of the extreme purity required in beryllium for nuclear use, the commercial grade oxide produced above must be further treated. Refining is incorporated into the Hazleton procedure.

A special magnesium reduction process, converts beryllium fluoride (made from the refined oxide) into metallic beryllium. In its initial form, the metal is a mass of irregular spheroids known as beads. They are vacuum melted and cast into billets that are 9 in. in diameter and weigh about 75 lb. In this form, the metal is delivered for fabrication into reactor parts.

Why It's Needed—The need for moderators and reflectors in power reactors arises from improved efficiency for fission.

A reflector sends back to the reactor core a portion of the neutrons which tend to escape during



The 100-kw induction vacuum furnace has a crucible capacity of 120 lb of beryllium (equivalent to 500 lb of steel). A rotary mold turntable inside the furnace allows up to five molds to be poured. F. J. Stokes Corp., Philadelphia, built the furnace

the fissioning of the fuel. A moderator reduces the speed at which the neutrons travel and facilitates their capture by fuel atoms.

Beryllium is an outstanding reflector material because it tends to "bounce back" neutrons rather than adsorb them. Its effectiveness as a moderator is due principally to this same property of low neutron adsorption and its low atomic weight which gives what nuclear physicists term "slowing down power" to enhance the efficiency of neutron capture.

Beryllium is the only metal that has the necessary atomic weight required of a moderator and a high melting point.

Several reactors now operating employ beryllium. (The metal has been produced in a small AEC plant operated by Brush Beryllium Co. at Luckey, Ohio.) The Materials Testing Reactor, in Idaho, is using close to 6000 lb of beryllium as a reflector. In the Submarine Intermediate Reactor, it's used as a moderator.

The quantities of beryllium ordered by AEC are large and suggest further applications for the metal in the submarine propulsion program and possibly in nuclear aircraft.

Nonnuclear Applications — Because of its lightness, high stiffness (about one-third higher than steel) and high temperature properties, beryllium has promise as a structural metal for high speed aircraft and missiles. Since it is not too ductile, several programs are under way to develop suitable fabricating techniques.

Another promising field of application is in aircraft instruments. The lightness and high stiffness of the metal offer dimensional stability over prolonged periods.

Beryllium Corp. predicts that the availability of beryllium with the physical characteristics of light metals and some of the properties of steel will be of broad interest to designers of aircraft and electronic instruments.

Other Uses—Large scale production of the metal may reduce costs and expand applications in areas outside aircraft and atomic energy.

Recently, cast beryllium-copper dies have been used for short production runs of steel forgings, for making zinc diecastings, and for forming and drawing titanium sheets (STEEL, July 30, 1956, p. 116). Since cavities are cast directly into the dies, tool costs are decreased.

Nickel-base beryllium alloys are being investigated for extrusion dies for aluminum and titanium. Reduced machining costs may make this application competitive with steel. Magnesium alloys containing a small amount of beryllium also look promising.

In aluminum hot dipping of steel, a small amount of beryllium retards formation of a brittle iron-aluminum interface. This could possibly develop into an important outlet for the metal in the steel industry.

Established Alloy — The precipitating hardening effect of beryllium in copper (first recognized in 1927) has resulted in broad applications for beryllium-copper alloys. Strength properties equivalent to high strength steel are developed; other valuable characteristics: High electrical and thermal conductivity, hardness and good machinability. The alloys are also nonmagnetic and nonsparking.

Two alloys are in widest use today: One contains 2 per cent beryllium, the other about 0.5 per cent. The 2 per cent has excellent mechanical properties; the 0.5 per cent offers about half the strength of the 2 per cent, but its electrical conductivity is better.

Where wear is a problem and electrical characteristics are important, components for electrical and electronic equipment will continue to use increasing amounts of these alloys.

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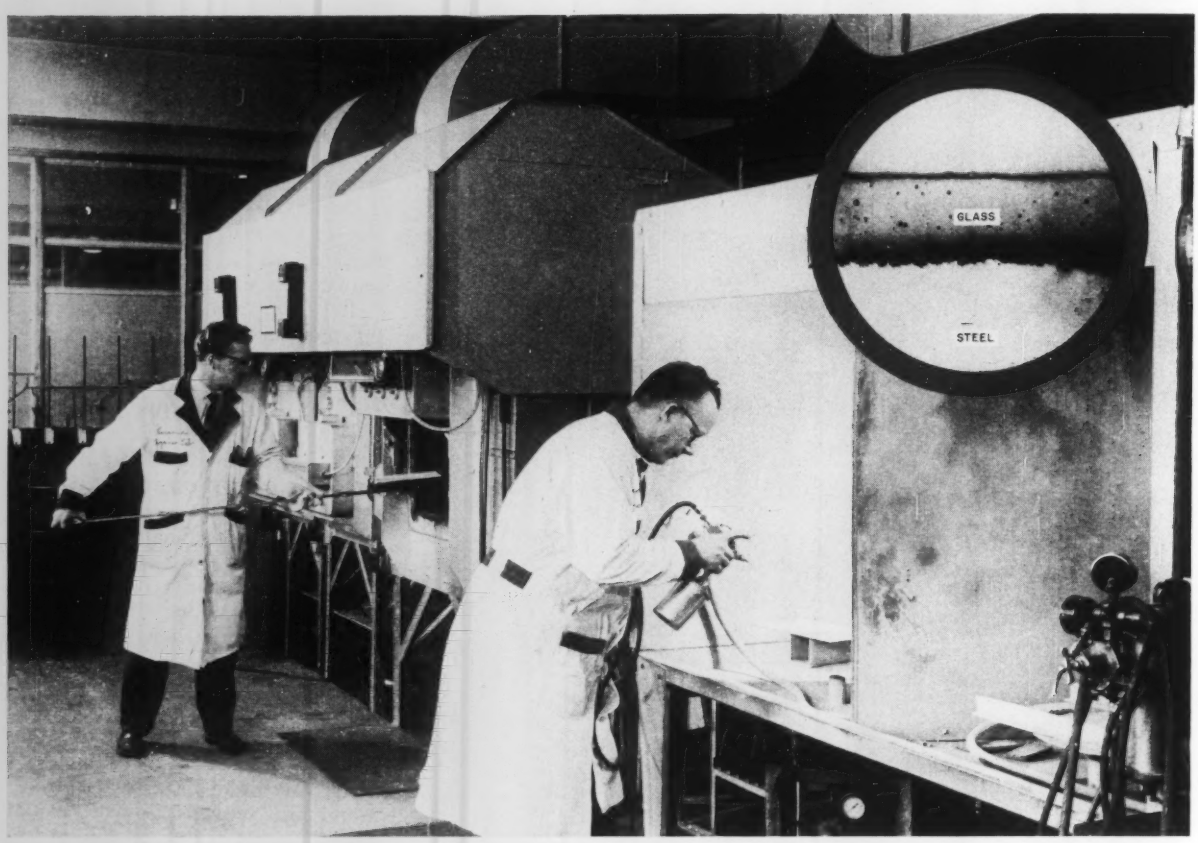


The man in the foreground is spraying an experimental part with slip at the A. O. Smith lab. The one in the back is putting experimental parts through the firing cycle. The microphoto inset shows the glass-metal bond

What Glass Can Offer Metal

Glass and steel combine to resist corrosion and to reduce abrasion and friction. Over 3400 glass formulations are available for application to new uses

SOON you will be using glass coatings to protect metal parts such as bearings, gears, cams, and pistons. Strength is hardly a problem. If glass is properly bonded to steel, it cannot be separated from the metal until the yield point of the base metal is exceeded. Its adherence ranges up to 10,000 psi.

Glass has many applications because of its favorable properties, including: Resistance to weather and corrosion, nonporosity, high dielectric strength, resistance to high temperatures, and adjustable coefficient of expansion.

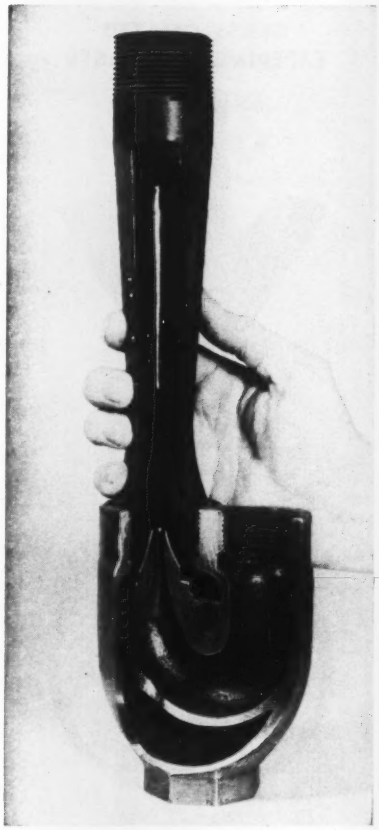
Translated into user benefits, they mean: Reduced friction, less wear and maintenance, greater efficiency, and longer unit life.

No. 1 Use—The protection of metals against corrosion ranks first. Since glass is chemically inert, you can get compositions that resist all organic and inorganic acids except hydrofluoric. (Silicon, a major component of glass, is soluble in that acid.)

Steel also oxidizes on contact with air and moisture unless its surface is protected. Glass makes an ideal coating because it does not absorb water.

Potential Uses—The accompanying exhibit will give you an idea of the range of established applications. But they're only the beginning. Last year, A. O. Smith Corp., Milwaukee, offered its research facilities to any manufacturer seeking a solution to problems in metal corrosion and abrasion.

Over 1000 requests for help have been received. They range from glass coated plowshares to uses



A pump venturi is glass coated for wear resistance

By
CHARLES E. BULLOCH
Director of Product Development
FORREST NELSON
Director of Ceramic Research
A. O. Smith Corp., Milwaukee

in atomic energy equipment and jet planes.

Several Suggestions — Besides corrosion and abrasion resistance, glass has other metalworking uses. Glass coatings are free of porosity and impervious to absorption. Their high dielectric strength and weather resistance make them useful around electrical equipment such as aircraft relay contactor boxes.

High temperature resistance and nonporosity suggest many uses in the nuclear development field.

The coating also reduces friction. Example: Metal rings used to wind threads on spools in the textile industry. Glass coatings

Applications and Advantages of Glass Lining

JET EXHAUST PORTS

Prevents base metal oxidation; increases part life. The coated piece can be used at higher temperatures.

ROTARY MECHANICAL SEAL

Reduced friction; less maintenance and part replacement.

EVAPORATORS

No contamination; material does not adhere to glass.

ELECTRICAL EQUIPMENT

Electrical insulation; weather resistant.

PROCESS EQUIPMENT

Easy to clean and to sterilize with harsh chemicals; no contamination.

TRANSMISSION PIPE

Less friction; resists corrosion; easy to flush clean.

HEAT EXCHANGERS

Increased efficiency; corrosion protection; lightweight metals can be used.

HOT WATER HEATERS

Corrosion resistance; increased efficiency of cathode protection; insulative qualities; thermal shock resistance.

SMOKESTACKS

Resists flue gas corrosion; lowers initial cost when compared with brick or concrete stacks; shorter erection time; less maintenance and longer life; outside glass coating improves appearance, weather resistance.

STORAGE STRUCTURES (harvesters)

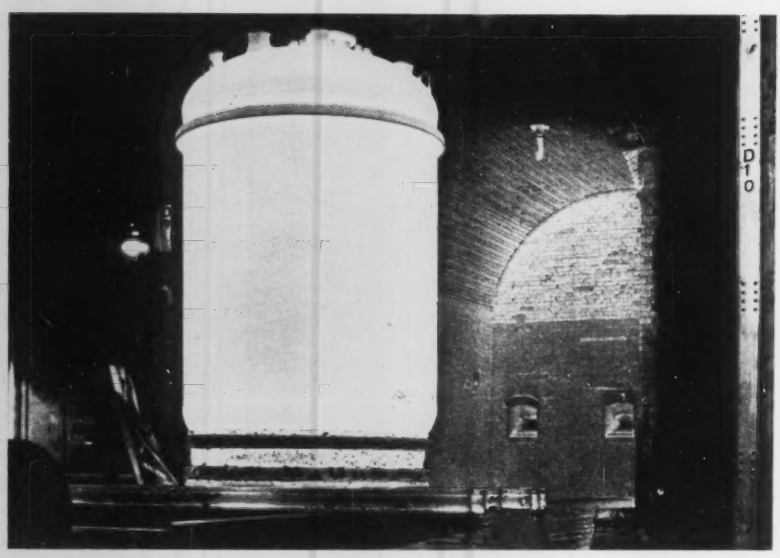
Preserves original quality of bulk products; prevents spoilage; minimizes repair and maintenance.

CHEMICAL VESSELS

Eliminates contamination; easy to sterilize; prevents catalytic action.

PUMPS

Chemicals don't adhere to smooth surface; improved operation; less friction; reduced weight.



This reactor vessel has been fired to fuse glass to the metal

have a potential of doubling the lifetime of these parts.

Designers Take Note — When using the glass coating process, you may find that the controlling factor is the strength of the part at high temperatures.

For example, ¼-in. walls in a brewery tank are sufficient to withstand 15 psi. But in firing the tank to 1600° F to fuse the glass and metal, it would sag and distort. The thermal stress is emphasized because the piece is usually heated to firing temperature in as short a time as possible.

Proper metal fabrication is important. Heavy sections must not be welded to light sections. All points must heat up and expand at the same rate.

Welds must be free of pinholes, dirt, and grease. This is done by baking electrodes (at least to 600° F) to remove all moisture and prevent the formation of hydrogen.

Welds are finished to aid in the application of the coating.

Choose Your Glass—More than 50 materials can be used to make glass. The composition should be tailored to the application.

Elements selected are blended and charged in a box smelter. The molten glass (about 2300° F) is quenched in a bath of cold water which shatters it into small pieces called "frit."

Range of Metal—Glass can be fused to copper, aluminum, silver, and gold, but its major union has been with low-carbon steels in industrial applications.

For example, in the fabrication of glass-lined brewery storage tanks, reactors and water heater tanks, a rimmed steel (ASTM designation A-285) with a carbon content of 0.20 per cent or less is used.

Defects such as fishscaling, copperheading, blistering, poor adherence, and crazing are avoided through specially developed processes.

Coating Information—The base metal must be chemically or mechanically cleaned. A special clay, water, and frit are milled to form "slip," which is a suspension of finely ground glass particles. The slip is applied by spraying, dipping, or flow coating.

The piece is dried and baked in an oven. The temperature depends on the glass formulation, but it is usually 1600°F. Firing time depends on the structure and metal composition of the piece.

One coat is usually sufficient. In severe service, three to five are required.

Testing—A 30,000-volt spark tester is used to reveal pinholes and punctured thin spots. Visual inspection is often adequate.

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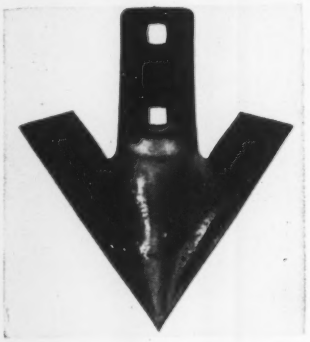
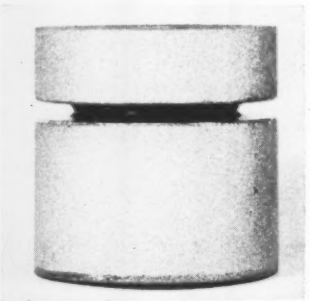
GLASS COATED EXPERIMENTAL PARTS

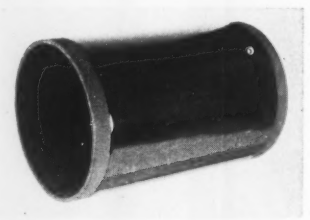


Cultivator sweeps

Piston rings



Textile winding spools



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Deep Drawn Stampings

Aircraft motor pan deep drawn from 18 ga. aluminum alloy, 5" deep, 11½" wide, 29½" long. Drain bushings and dip-stick tube welded in place by T & W, using shielded-arc welding.

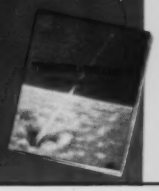
Forgings

Part for high temperature service. This is upset-forged from Greek Askalloy (AMS 5616B). T & W is experienced with titanium, and newer special high temperature alloys.

T & W Technique

Creep test equipment, one of the facilities which permit T & W to make the laboratory and production tests, such as stress rupture tests, ultrasonic inspection, required for aircraft parts.

Write for this 20-page book, "Transue & Williams Challenges the Future," explaining how T & W technique produces forgings and stampings that cost you less at your point of assembly.

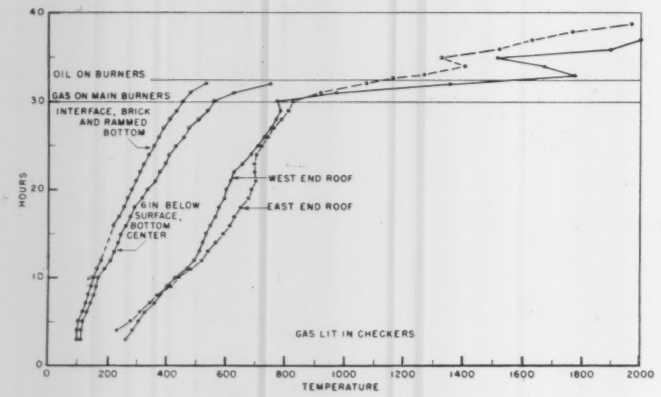


FORGINGS AND DEEP DRAWN STAMPINGS

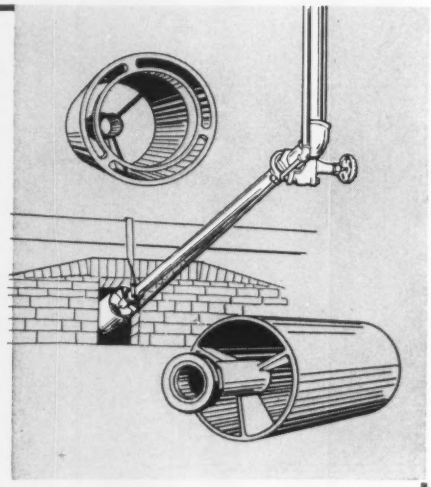
TRANSUE & WILLIAMS
ALLIANCE, OHIO, U. S. A.

Name _____ Title _____
Company _____
Street _____
City _____ State _____

1303



Progress of roof and bottom heat-up on No. 6 open hearth furnace, No. 1 shop, Indiana Harbor Works, Youngstown Sheet & Tube Co., East Chicago, Ind.



Installation of gas burner in checker bulkhead and details of burner construction

Heat Over Checkers Speeds Light-Up

After an open hearth furnace rebuild, Youngstown Sheet & Tube finds it can cut 6 to 12 hours off time to the first heat by burning gas on top of the checkers

WHAT'S the best way to light up an open hearth furnace?

Thomas D. Hess, superintendent of the No. 1 Open Hearth Shop, Indiana Harbor Works, Youngstown Sheet & Tube Co., casts a vote for burning gas over the checkers.

For years the shop heated up after rebuild by burning gas from holes in a pair of pipes running the length of the hearth along front and back banks. The method was too slow by several hours. Under the conditions of rebuilding, it was difficult to get enough draft through the furnace to increase the heat-up rate.

An attempt to speed up the time on first heats by burning gas through the combination burners at the ends of the furnaces succeeded only in creating more problems. Gas flow was uneven, and the flame floated along the roof where it caused excessive spalling.

Checker Burner — The winning combination turned out to be an adaptation of a method used at the Pueblo (Colo.) plant of Colorado Fuel & Iron Co. The shop constructed air-aspirating burners consisting of a 2-in. pipe concentrically located within a short length of 6-in. pipe. One of these was set in the wall of each of the four checker chambers, just above the top of the checker brick.

Air saucers are closed, stack and boiler dampers lowered, and the center furnace door opened. Drafting is done out this door. All the heat now comes from the flue gases instead of radiation from open flame. There's no danger of localized overheating of the roof, and the old light-up-to-tap time of 36 to 48 hours following a roof rebuild has been cut to 24 to 32 hours.

New Bottom—The method was first tried on a furnace which had been rebound and had a new inverted arch brick bottom. This was covered with 13½ in. of densely rammed 95 per cent MgO ramming material. In this form of construction, moisture removal is a big problem.

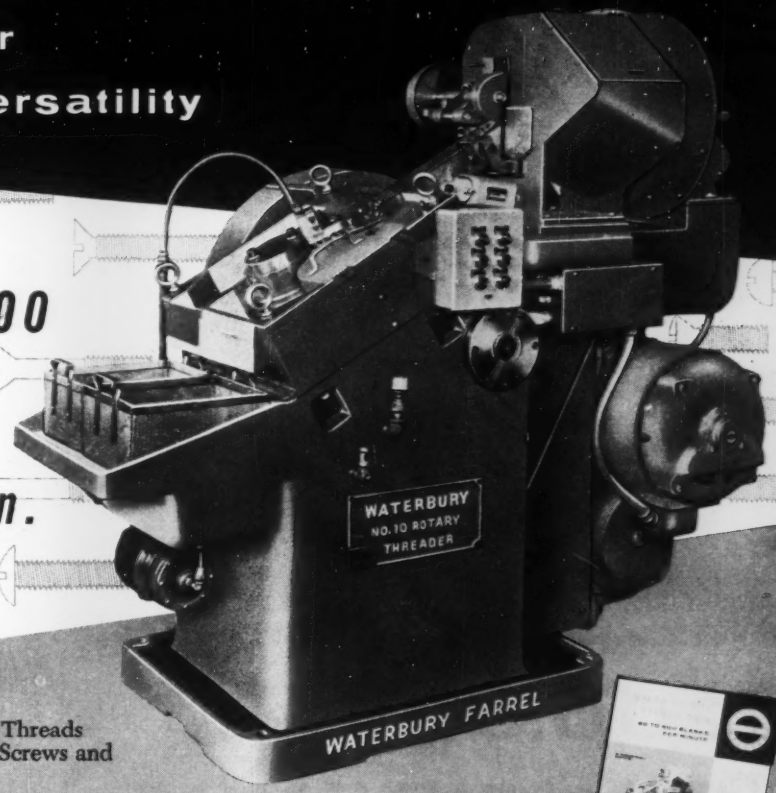
"We are going in the wrong di-

NEW WATERBURY FARREL

ROTARY DIE THREADER

for short or
long run versatility

60 to 600
Blanks
Per Min.



- Flexible Production — Threads All Types of Machine Screws and Other Headed Parts
- Handles Blanks from ¼" to 2" long — Threads diameters from #6 to ¼"
- Threads Stainless Blanks at 60 to 200 per min.
- Threads Blanks of standard material at 200 to 600 per min.
- Backed by Waterbury Farrel's Century Long Reputation for Precision and Rugged Design

For further information and specifications on this new low investment machine, send for this free bulletin.

THE WATERBURY FARREL FOUNDRY & MACHINE CO.
SALES OFFICES:
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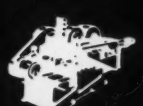
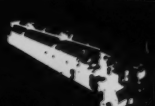
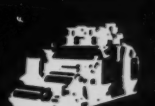
FOUNDED 1851

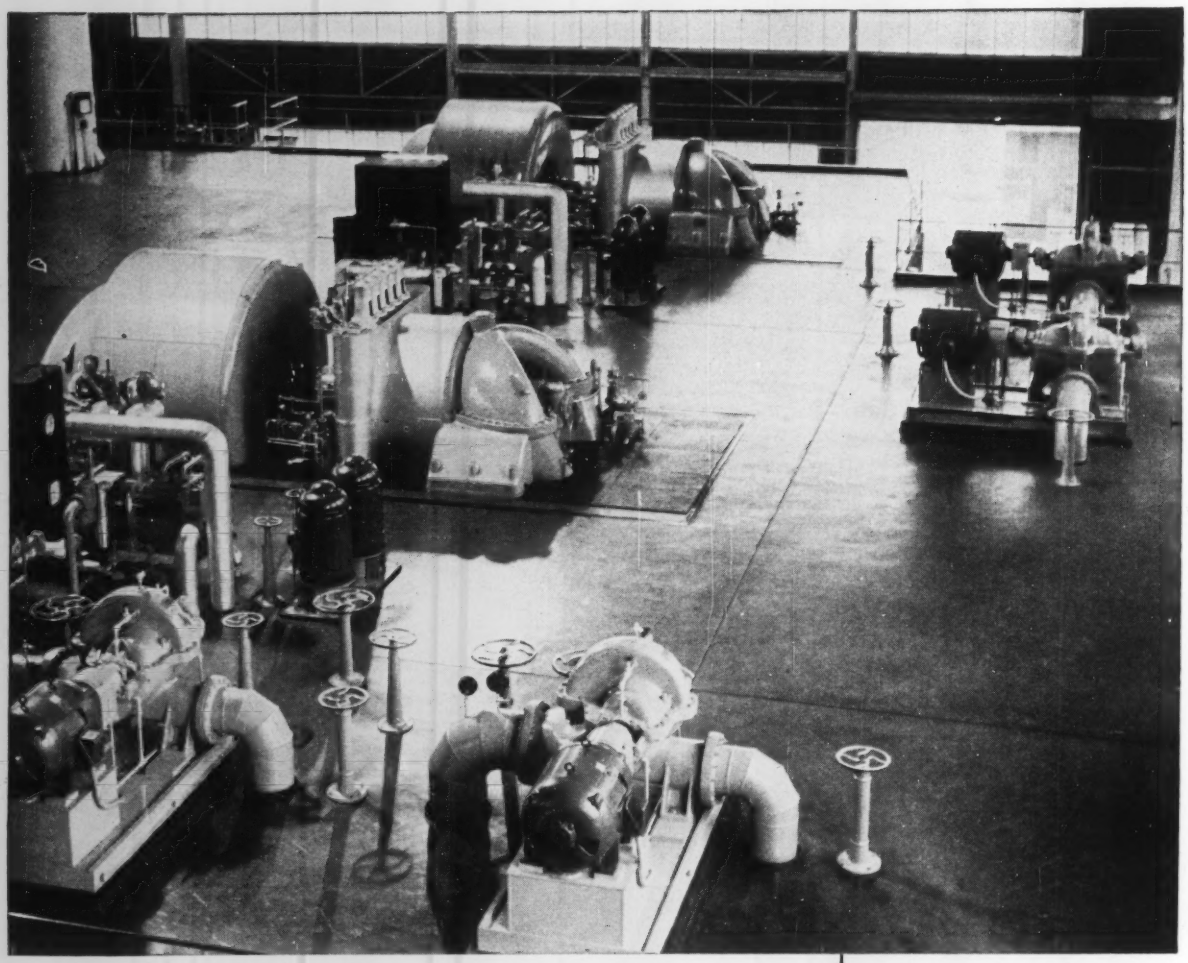

Bolt, Nut & Screw Machinery

Power Presses

Rolling Mill Machinery


Wire Mill Equipment


Sendzimir Mills and Other Special Machinery



200,000 cfm of CONFIDENCE

in I-R Blast Furnace Blowers

Here's the blast-furnace blower room of a large steel mill. In it, there are two 100,000 cfm I-R Turbo-Blowers—identical twins, each complete with I-R steam turbine drives, surface condensers, circulating pumps and condensate pumps. Unit No. 1 was installed in 1948, followed by Unit No. 2 in 1953.

Repeat orders like this are a real vote of confidence in I-R turbo-blower equipment. Confidence that's multiplied a hundred fold by similar installations in leading plants from coast to coast. Confidence that explains why Ingersoll-Rand sells more—*far more* large heavy-duty blast-furnace blowers than any other manufacturer. Ask your I-R representative for full details on the blower best suited to your needs.

Each of these two **TURBO-BLOWER PLANTS** includes the following equipment:

BLOWER . . .
100,000 cfm of air at 30 psig.

TURBINE . . .
11,150 hp . . . condensing.

CONDENSER . . .
Two-pass, 11,000 sq ft of cooling surface . . . vertically divided for cleaning.

STEAM-JET AIR EJECTOR . . .
Twin element, 2-stage . . . mounted on Surface Inter-and-After-Condensers.

CONDENSATE PUMPS (2) . . .
8-stage vertical . . . rated 275 gpm, 300 ft head at 1450 rpm.

CIRCULATING-WATER PUMPS (2) . . . Single-stage double-suction rated 6,000 gpm, 30 ft head at 480 rpm.

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12-272

COMPRESSORS • AIR TOOLS • ROCK DRILLS • TURBO BLOWERS • CONDENSERS • CENTRIFUGAL PUMPS • OIL AND GAS ENGINES

rection," says Mr. Hess, "when we introduce heat in the hearth, lower the furnace dampers and in effect create a condition where there is almost no draft. In drying out any piece of equipment, draft is just as important as the source of heat. Evidence of this is the steam which condensed on the water-cooled center door of the furnace and accumulated in a pool in front of the door during the early stages of light-up."

Heat-Up Rate — Thermocouples were installed in each end of the roof, in the center of the hearth at the junction of the brick and ramming material, and 6 in. below the rammed surface. This is the light-up procedure:

1. Bring roof up 40° F per hour until thermocouple buried 6 in. below hearth surface becomes readable.

2. Switch control to thermocouple and heat bottom 15° F per hour to 400° F (beyond which point the bottom can no longer be damaged).

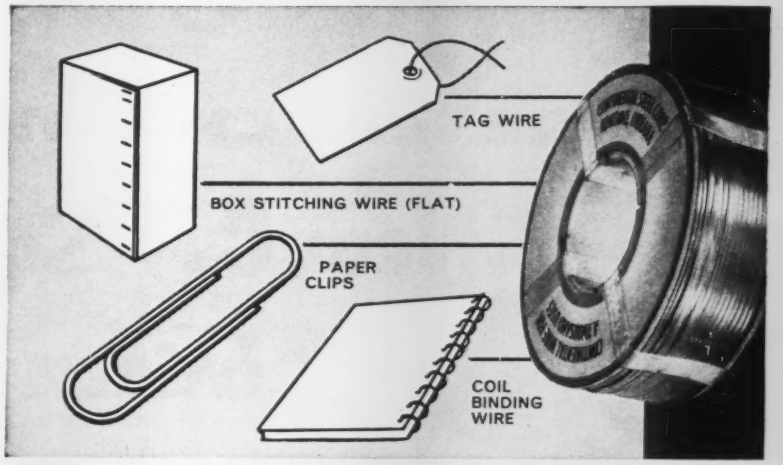
3. Switch to regulating heat input by roof temperature.

The furnace started charging 56 hours after light-up, and the first heat (a cold charge) was tapped 12 hours later. Time-temperature progress of the light-up is shown in the chart.

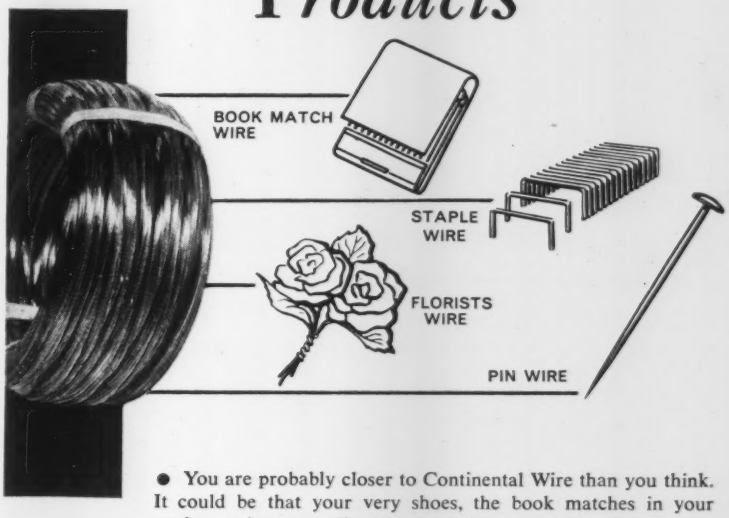
Control — Wires from the roof thermocouples were run to a recorder in the basement near the checker chambers. From this vantage point the first helper could regulate roof temperature and keep a close watch over the burners. (There's some danger of explosion if one of them goes out.)

Burners were started with a gas flow of 36,000 cu ft per hour (9000 cu ft per hour on each burner). By the time 6-in. thermocouple reached 400° F (and the roof about 800° F), burners were using 60,000 cu ft of gas per hour.

Mr. Hess feels that the additional gas burnt before putting fuel on main burners is more than compensated for by tapping the first heat in shorter time. The burners are easy to install and remove—much easier than stringing two 75-ft lengths of pipe in a hot furnace, and the cost of the pipe is also saved.



Fine and Specialty Wire for Super Fine Products



● You are probably closer to Continental Wire than you think. It could be that your very shoes, the book matches in your pocket or the paper clips in your desk—were made using dependable Continental Fine Wire! That's because Continental is preferred by hundreds of leading firms for literally thousands of different fine wire applications. For super fine products—you, too, should try Continental Fine and Specialty Wire, available in many sizes, of almost any temper, finish or analysis, in low carbon and medium low carbon steels.

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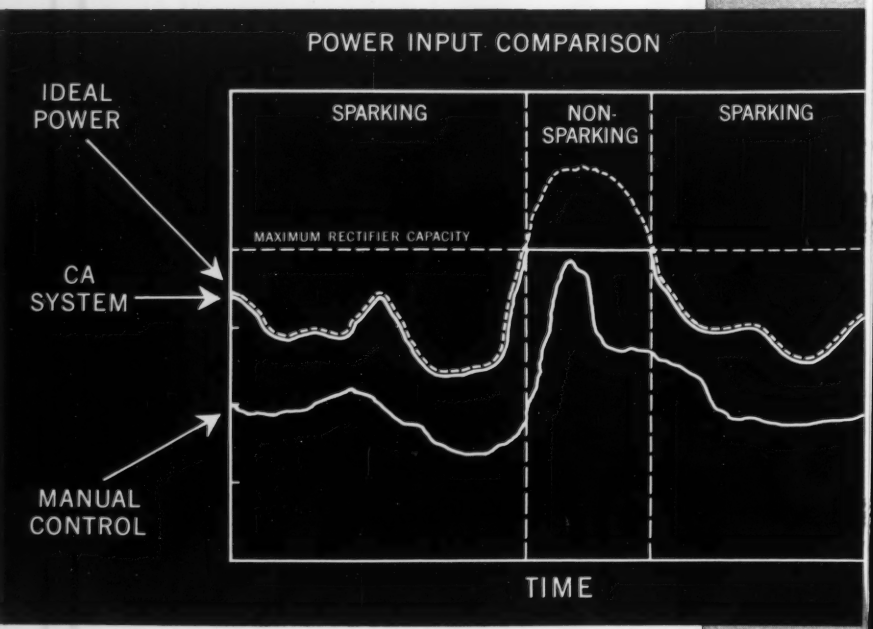
PRODUCERS OF: Manufacturers' Wire in many sizes, tempers, and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, and special shaped wire. Also Welded Wire Reinforcing Fabric, Nails, Continental Chain Link Fence, and other products.

RESEARCH-COTTRELL'S

New CA System brings Auto to precipitators

Higher "around-the-clock" collection efficiency without any manual adjustments. That sums up the major advantages of Research's new Cottrell Automation System.



The chart at the left shows how the CA System provides these advantages. As you know, ideal electrical power input to a precipitator is not constant. It varies with changes in gas composition, temperature, rate of flow and humidity, as well as characteristics of the dust, such as size, electrical resistivity and extent of build-up on the electrodes. With conventional controls, manual adjustments cannot keep pace with these changing conditions. This difference between *ideal* electrical power and *actual* power input, under manual control, is shown in the chart. This

mation

difference means lower collection efficiency.
The fast acting electronic circuits of the CA System provide the best practical approach to ideal electrical power. During periods of sparking, electrical power input is controlled by the optimum sparking rate, which can be easily pre-set to any value between 0 and 500 sparks per minute. Under some conditions power input would have to be increased beyond the capacity of the electrical equipment in order to maintain this optimum sparking rate. During such periods the power input is governed by the *capacity* of the electrical equipment. This condition is shown in the center vertical section of the chart.
For more information on this new automation development write for your copy of Bulletin CA. It has a detailed description of how the Cottrell Automation System works and how higher "around-the-clock" collection efficiencies and lower operating costs are obtained.

Research-Cottrell

RESEARCH-COTTRELL, INC., Main Office and Plant: Bound Brook, New Jersey • 405 Lexington Ave., New York 17, N. Y.
Grant Building, Pittsburgh 19, Penna. • 228 No. La Salle St., Chicago 1, Ill. • 58 Sutter Street, San Francisco 4, Cal.

Lead length of wire used to thread machine is used for test piece. Inset shows testing machine

Selecting Coils Electronically

Sensitive tester can separate metals which have only small variations of composition. One manufacturer has drastically reduced time required for inspection

SEPARATING steel coils used to make high strength fasteners is done in minutes with a Metal Monitor at Ramset Fastening System, Cleveland.

The coils are cold headed into driving pins and threaded studs used for hard surfaces such as steel and concrete. It is important that the proper material be used for each type fastener.

Incoming raw materials include high and low carbon steel wire. A low carbon steel fastener wouldn't penetrate hard surfaces.

Old Method—Ramset processes 10 to 20 of the 250 to 300 lb coils each day.

Formerly, incoming coils were checked by heat treating a sample and giving it a hardness test.

The job took an inspector up to 2 hours a day.

New Method—The Metal Monitor, made by Brush Electronics Co., Cleveland, reduces checking time per coil to seconds.

The lead length used to thread the machine is tested at the cold heading machine at the start of each new coil. The Metal Monitor can even distinguish between ASTM 1060 and 1062 series steels.

This testing saves hours of inspection each week and prevents a costly resorting job involving thousands of fasteners.

Clean Air Cleaners

New company makes a business of maintaining the efficiency of electrostatic precipitators

CLEANING an electrostatic precipitator is no job for amateurs, maintains Premsco Inc., Ashland, Ohio.

Premsco (for Precipitator Maintenance Co.) has discovered that steel plant maintenance personnel are glad to have someone else tackle their dirty precipitators. They are difficult and dangerous for the uninitiated to clean, and it is easy to knock them out of electrical adjustment.

The service consists of: 1. Inspection and cleaning, including removing loose scale and rust. 2. Adjustment and inspection of operating parts, including electrical components.

By keeping the service on a regular basis, it is possible to maintain the precipitators at high efficiency.

Savings—In one large mill, the company says it has cut the cost of precipitator maintenance 29 per cent. Down time for maintenance has been chopped in half; precipitators are operating at their intended efficiency; and plant maintenance personnel are released for other jobs.

The service is performed every three months and takes about five working days for the two precipitators.

Premsco has equipped a truck with high pressure, high capacity pumps and chemical tanks to aid in the work. Spray nozzles are equipped with spotlights to give good illumination in the dark interior of the precipitator. The service truck carries replacement parts as well as cleaning equipment. The mill furnishes steam and water.

With the number of precipitators in use growing larger every year, C. Wayne Baughman, Premsco's president, sees a fertile field for services such as his. Maintenance work can be scheduled the year round, except for the coldest winter days in the north, when icing makes the work almost impossible.

3 dependable products for the diesel industry

DE LAVAL IMO PUMPS

De Laval IMO pumps do a dependable job during long years of service. The reason is IMO design simplicity. De Laval IMO's have only three moving parts—smoothly intermeshing rotors that propel the fluid axially in a steady flow without churning, pocketing or pulsation. There are no reciprocating parts to wear or become noisy. Quiet, compact IMO pumps are excellent for direct-connected, high-speed operation. They can be furnished in capacities to 1,000 gpm and pressures to 1,500 psig.

DE LAVAL HYDRAULIC FAN DRIVES

De Laval Hydraulic Fan Drives for air cooled heat exchangers and cooling towers offer these important advantages. They *save* power since the fan operates at full speed only a portion of the time. They provide *accurate, automatic* control of engine jacket water temperature, and also assure complete operational flexibility. These units stay on the job for years. As shown, both IMO motor and speed reducer are mounted and factory aligned on a single bedplate.

DE LAVAL HIGH PRESSURE TURBOCHARGERS

De Laval turbochargers offer pressure ratios of 3:1 as well as higher compressor and turbine efficiencies than those found in conventional turbocharger systems. Output of heavy duty diesel, gas and dual-fuel engines may be doubled by De Laval turbochargers without increasing thermal loading. Exclusive Monorotor design offers a compact lightweight unit of sturdy construction. De Laval turbochargers are self-adjusting to engine loads, can be used on 4- *and* 2-cycle engines.

You'll find additional data in these De Laval Bulletins. Write for your copies.

DE LAVAL

Steam Turbine Company

TRENTON 2, NEW JERSEY

How to move a mountain of coal—economically

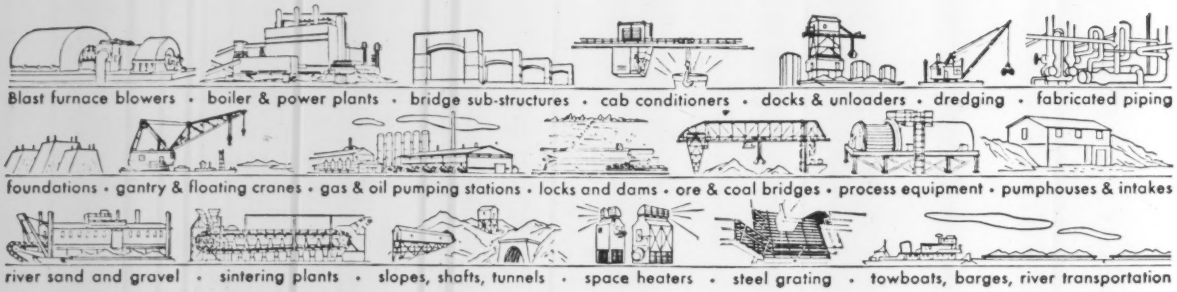
Coal is essential to steel production. Every day huge quantities of it are converted into coke for use in blast furnaces. Maintaining adequate supplies is a big transportation job, where small savings on every ton multiply into impressive totals.

Designed especially for this type of work, modern river towboats and large-capacity barge fleets provide low cost freight service over the inland waterways system. Vessels like Island Creek Fuel and Transportation Company's *Raymond E. Salvati,* above, deliver up to 18,000 tons of coal per trip. Such Dravo-built towboats are products of many years of research, studies in actual service and scientific model basin testing. Engineered for low operating costs, they produce benefits for consumer *and* transporter.

Experience in constructing more than 3,700 hulls enables Dravo to build this kind of performance into many types of floating equipment. For more information on any of the products and services listed below, write to DRAVO CORPORATION, PITTSBURGH 25, PA.

DRAVO

CORPORATION



Blast furnace blowers • boiler & power plants • bridge sub-structures • cab conditioners • docks & unloaders • dredging • fabricated piping

foundations • gantry & floating cranes • gas & oil pumping stations • locks and dams • ore & coal bridges • process equipment • pumphouses & intakes

river sand and gravel • sintering plants • slopes, shafts, tunnels • space heaters • steel grating • towboats, barges, river transportation

Triple-Action Press

One of the largest ever built, it will handle bolsters up to 100 by 200 in.

TWO triple-action presses at the Ford plant in Chicago Heights, Ill., are expected to handle body stampings large enough for any future car design.

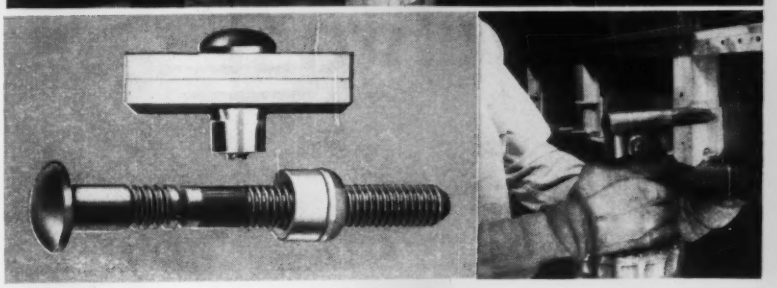
Feature — Bolster and blankholder dimensions are 100 by 200 in. Built by Hamilton Division, Baldwin-Lima-Hamilton Corp., Hamilton, Ohio, the presses feature bottom drive construction. Both upper slides can be pulled down by stretchable rods, allowing production of stampings of varying thickness without blankholder adjustment.

All controls—mechanical, electrical, and pneumatic—are integral and confined within the press framework. It makes installation quick and easy, operation and maintenance safe and simple.

COMPACT PRESS
. . . fits under 19-ft ceiling

Timing — Mechanically synchronized actuation of all three slides from a single main drive prevents improper slide timing. Synchronization is not affected by air or electrical failure, and, say the makers, there are no breaks in timing (possible in a double-drive scheme).

Eddy current clutches and elec-



Townsend Lockbolts Provide Strong, Vibration-Proof Joints For Rugged Fruehauf Volume ★ Vans

Rugged, high-payload Volume ★ Vans are built using Townsend lockbolts† at critical points to provide the utmost strength. "Fruehauf uses lockbolts because they result in a uniform, high-strength, vibration-proof joint without need of skilled operators," says George Chieger, Executive Engineer.

Townsend lockbolts are easy to apply. The gun engages the pull grooves of the lockbolt. As the trigger is depressed, the work is drawn together with a high clinching action and the collar is swaged into the locking grooves of the pin, forming a permanent lock. The lockbolt pintail then is broken off at the breakneck groove, and ejected from the gun automatically. The entire operation is fast, and requires no special training or skill.

Lockbolts also have advantages in service work, says H. J. Biers, Fruehauf General Service Manager, "When field repairs are required that necessitate removal of lockbolts, they always are replaced with comparable lockbolts. If a better fastener were available, Fruehauf would use it."

For a complete explanation of how Townsend lockbolts can help you to obtain stronger, longer-lasting joints, allow us to send one of our representatives. He can give you a complete demonstration right at your desk. Townsend Company, P. O. Box 237-C, New Brighton, Pa.

†Licensed under Huck patents RE 22,792; 2,114,493; 2,527,307; 2,531,048; 2,531,049 and 2,754,703

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Townsend

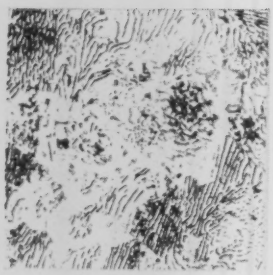
COMPANY • ESTABLISHED 1816

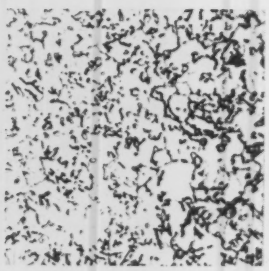
NEW BRIGHTON, PENNSYLVANIA

Sales Offices in Principal Cities

Cherry Rivet Division • Santa Ana, California

carbon-restored steel meets tightest specs





This steel mill easily meets the steadily tightened specifications of customers who demand stock with good surface finish, no "decarb," and uniform microstructures suitable for cold forming and automatic machining.

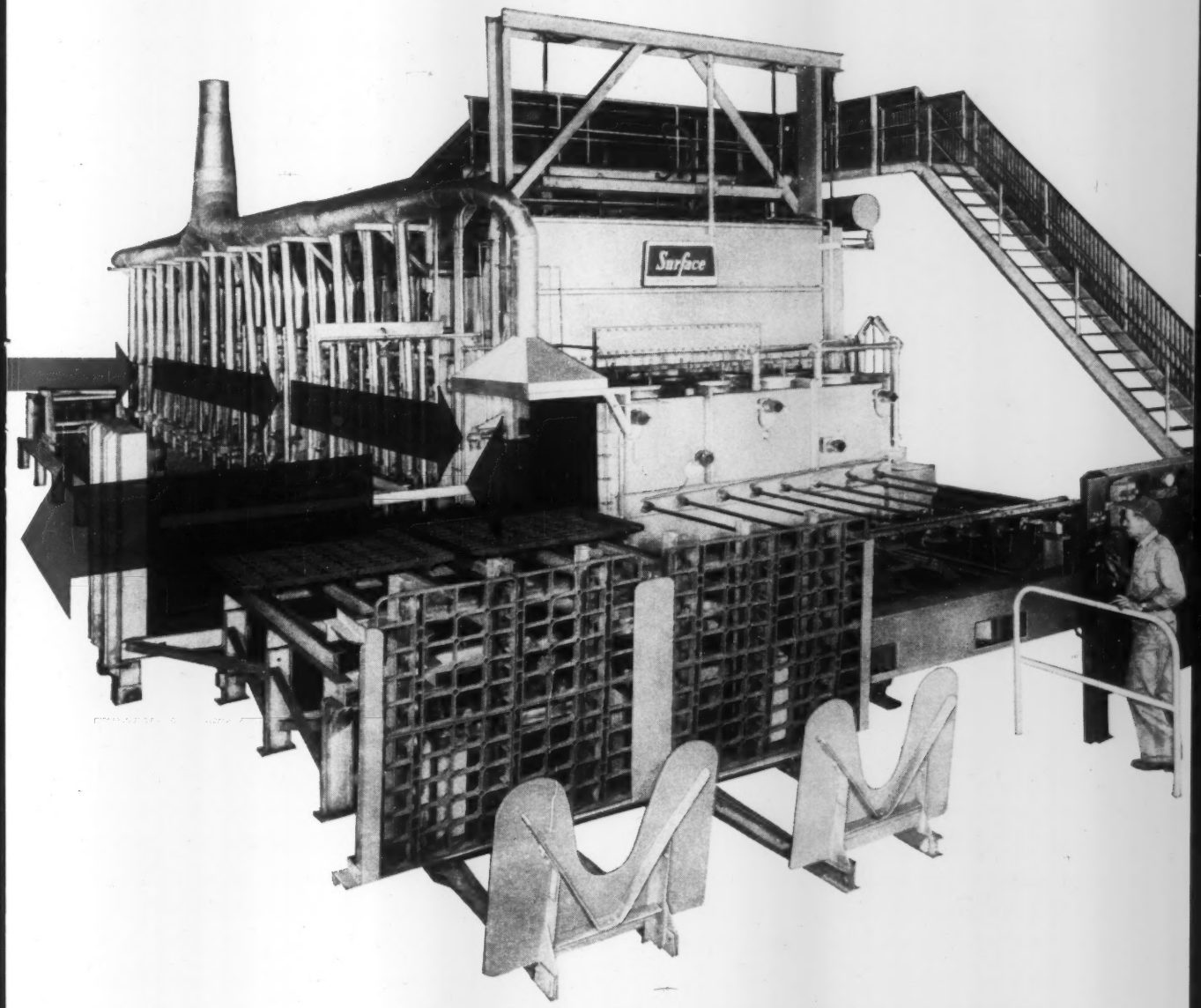
They do it by combining annealing and carbon restoration in a Surface continuous furnace. They get all the flexibility of cycle control they need with 6 zones, individually controlled. An RX® gas generator keeps the carbon potential of the furnace atmosphere in balance with the steels being treated. Automatic dew point recorders provide a continuous check on the atmosphere.

Production rates up to 1,000 tons per month make this furnace a profitable tool.

Again, Surface engineering transforms difficult specifications into profitable opportunities.

Surface Combustion Corporation, 2408 Dorr Street, Toledo 1, Ohio.
In Canada: Surface Industrial Furnaces, Ltd., Toronto, Ontario.

ASSOCIATED COMPANIES: British Furnaces, Ltd., Chesterfield • Stein & Atkinson, Ltd., London • Stein & Roubaix, Paris • S. A. Belge, Stein &



you can meet these specifications:

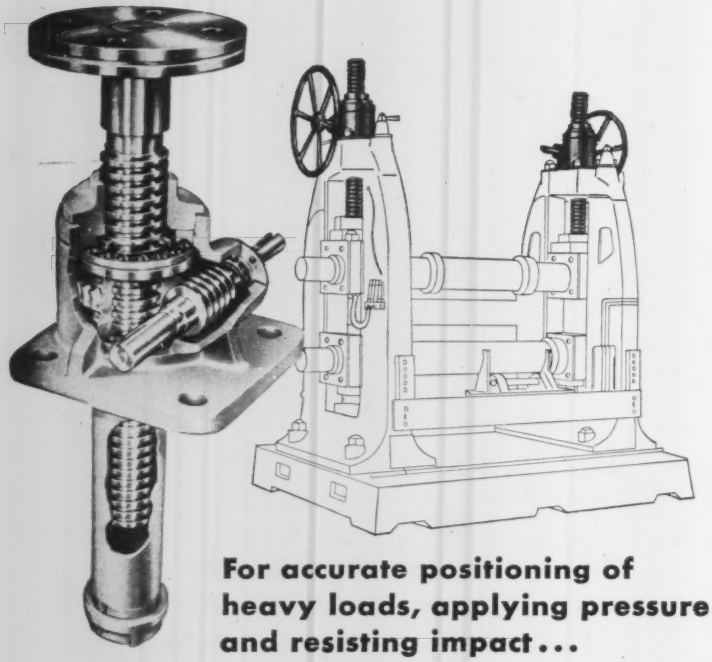
CYCLE ONE (sub-critical anneal)		CYCLE TWO (over-critical anneal)	
STEEL (AISI)	MAXIMUM-BRINELL	STEEL (AISI)	MAXIMUM-BRINELL
4042	160	4037	151
4140	170	4140	174
5140	166	8127	148
8740	170	8740	174

Cycle One production must show spheroidized structure. Cycle Two must show lamellar pearlite structure. Brinell hardness after annealing.

wherever heat is used in industry

Surface®

Roubaix, Bressoux, Liege • S. A. Forni Stein, Genoa • Chugai Ro Kogyo Kaisha, Ltd., Osaka • Benno Schilde Maschinenbau, A. G., Bad Hersfeld



For accurate positioning of heavy loads, applying pressure and resisting impact...

Duff-Norton Worm Gear Jacks

Duff-Norton worm gear jacks provide a purely mechanical means for accurately positioning loads weighing up to several hundred tons and maintaining them indefinitely without creep. They may be incorporated into the design of a new piece of equipment, or installed in existing facilities to replace other positioning devices. They will operate in any position, and functioning as components of machinery or equipment, worm gear jacks can raise or lower loads, apply pressure, or resist impact.

Capacities range from five to 50 tons. When two or more are connected by means of shafting and mitre gear boxes to raise loads they lift in unison—even when the load is unevenly distributed. Worm gear jacks are available with standard raises up to 25 inches, and will maintain an exact raise through years of service without adjustment. Each of the six sizes has a standard worm gear ratio ranging between 6¾:1 and 32:1. They are made with either square or Acme threads, and give one inch raise for from 10 to 48 turns of the worm. Jacks are suitable for operation at ambient temperatures as high as 200°F.

Thousands of worm gear jacks are in use on feed tables, tube mills, welding positioners, pipe cut-off and threading machines, loading tables, rolling mills, conveyor lines, arbor presses and numerous other types of equipment. To learn how they can improve the performance of your equipment and save you money, write for bulletin AD-34-BB or ask for a Duff-Norton representative to call.

DUFF-NORTON **Duff-Norton Jacks**

DUFF-NORTON COMPANY

P. O. Box 1889 • Pittsburgh 30, Pennsylvania

COFFING HOIST DIVISION: Danville, Illinois

Ratchet Jacks, Screw Jacks, Hydraulic Jacks, Special Worm Gear Jacks, Ratchet Hoists, Electric Hoists, Load Binders, Spur Gear Hoists

TRIPLE-ACTION PRESS . . .

trical brakes were incorporated for variable - speed operations. They provide the best speeds during each portion of the cycle: Fast for nonproductive portions when advancing to and returning from the work, slow for the work portion.

You can also get a direct motor drive and a friction clutch and brake unit.

Design—Press parts have been designed for strength and rigidity. An automatic lubrication system is built in. The lower operating mechanism is lubricated by circulating oil, minor parts by a centralized grease setup.

Here is the press sequence:

1. 800-ton blankholder pulls down, holds the blank.
2. 800-ton inner (upper) slide pulls down, makes the draw.
3. 550-ton lower slide pushes up, makes a reverse form or blank.

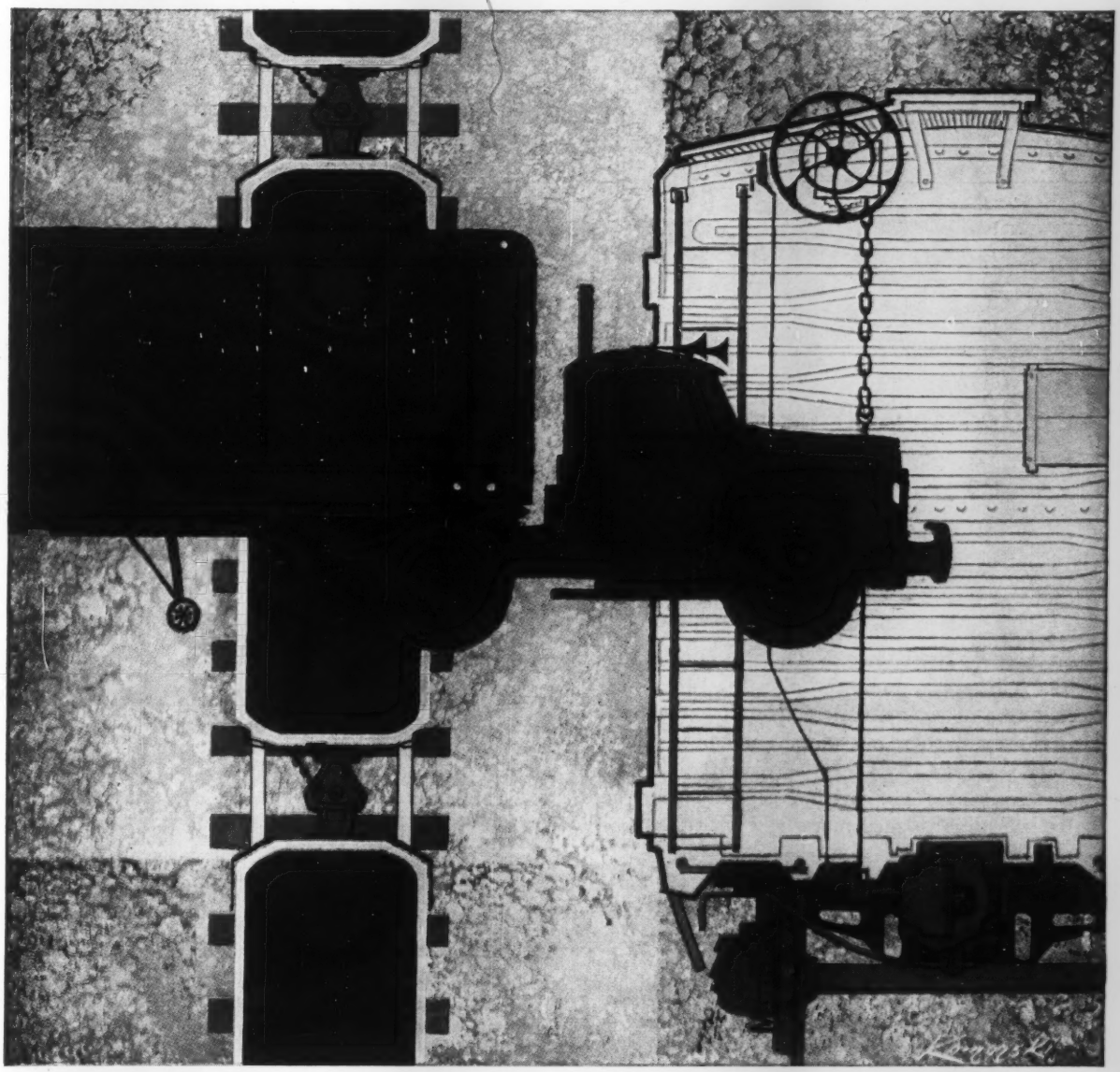
Speed is nine strokes a minute. The main drive is a 250-hp motor.

Most of the mechanism is accessible from a basement.

Bottom drive construction requires only 19 ft of headroom and a 17-foot basement.

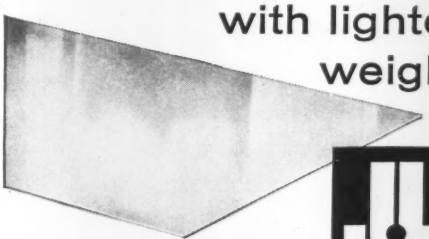
Testing Heating Elements

Research technician checks the life of resistance wire in this vacuum furnace. Optical pyrometer is an aid to controlling temperatures in the 1600 to 2600° F range. The device is used by Hoskins Mfg. Co., Detroit, to develop better alloys for heating elements used in vacuum furnaces. Such equipment is used for heat treating and brazing titanium and stainless steel



JALTEN low alloy, high-strength J&L steel

provides equal strength with lighter weight



Jalten permits high design loads with reduction in section. Usual reduction is two gages with weight saving as much as 25%.

High strength of Jalten is the result of balanced chemical composition, carefully controlled during production. Strength is retained through fabrication and welding without further heat treatment.

Jalten is available in the forms you require (plates, hot rolled sheets, hot rolled bars, small shapes and structurals). Jalten can be purchased in three grades to meet specific requirements for high strength, formability, impact, resistance to abrasion and corrosion.

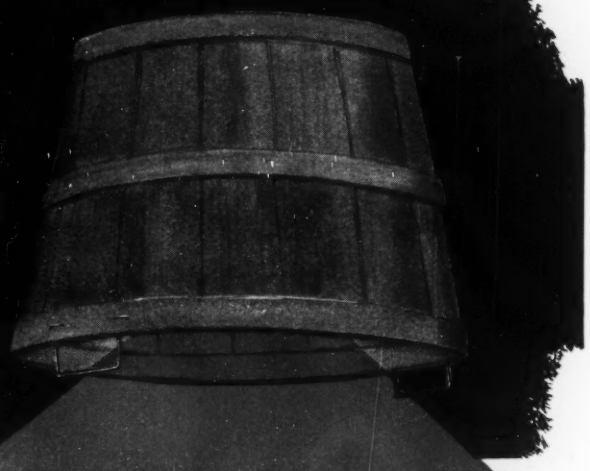
Your local distributor can supply you with information on Jalten, or you can write direct to the Jones & Laughlin Steel Corporation, Dept. 404, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

Jones & Laughlin

STEEL

. . . a great name in steel

Have We Been Hiding Our Light Under a Bushel?



Because we are known as The House of Stainless, it is natural that some folks think of us only in terms of their stainless steel requirements.

However, so many of our customers have shown surprise when they learn about our ever-increasing stocks of carbon steel items, that we feel it's time to shed more light on this phase of our operation.

Sure, stainless steel is the heart of our business, but our philosophy of service to CSS customers is to provide a dependable source for their carbon steel needs as well.

With this in mind, The House of Stainless has continued to expand warehouse stocks of carbon steel as listed here.

The next time you need any of these items in carbon steel, call LAfayette 3-7210 for the same personal attention you have come to expect on stainless steel requirements.

Just phone LAfayette 3-7210

CALL THE HOUSE OF STAINLESS FOR THESE CARBON STEEL ITEMS, TOO

STRUCTURALS . . .
H-Beams • I-Beams • Wide-flange Beams

PLATES . . .
4-way Floor Plate • Universal Mill Sheared • Plates (flame-cut to any shape)

SHEETS . . .
Hot Rolled • Cold Rolled • Coated Galvanized and Ti-co • Paintlok

ANGLES . . .
Bar Size • Galvanized • Structural

HOT ROLLED BARS . . .
Rounds • Squares • Flats • Band Size Strip

CHANNELS . . .
Bar Size • Structural

COLD FINISHED BARS
Shafting • Screw Stock • Rounds • Squares • Hexagons • Flats

The House of Stainless
STEEL AT YOUR SERVICE

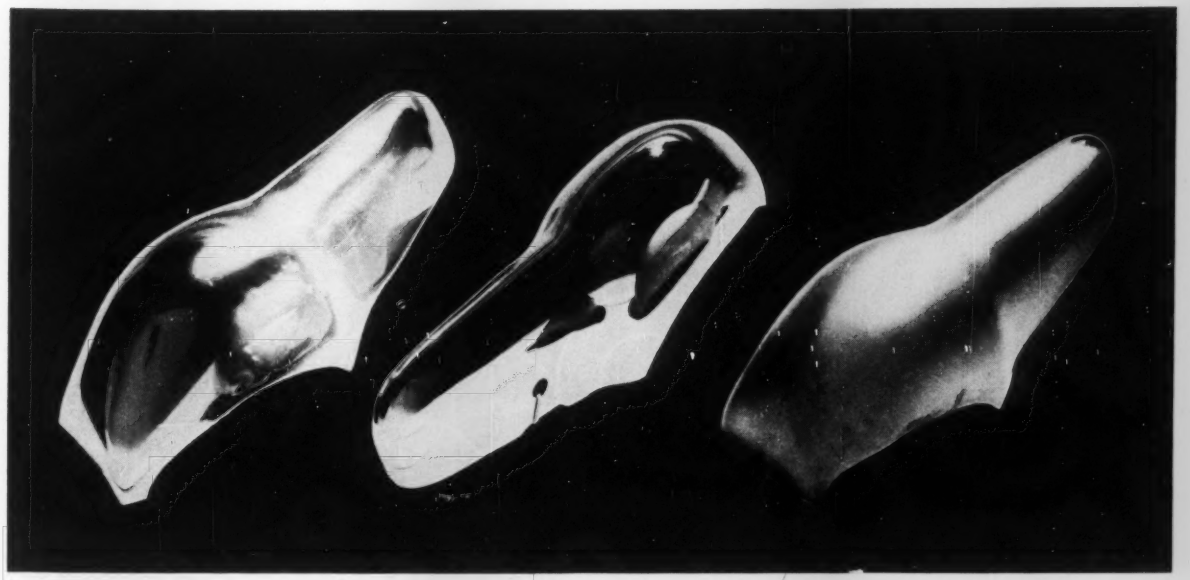
CHICAGO STEEL SERVICE COMPANY

Kildare Avenue at 45th Street, Chicago 32, Illinois • Mailing Address: P. O. Box 6308, Chicago 80, Illinois

Milwaukee District Office: 757 N. Broadway, Milwaukee 2, Wisc. Telephone BRoadway 3-7874

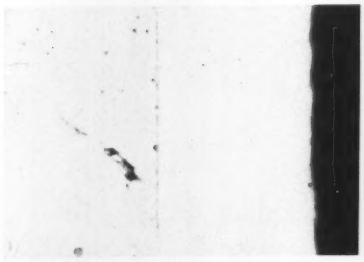
Sales Representatives at Bloomington and Rockford, Illinois; Indianapolis and South Bend, Indiana; Cedar Rapids and Davenport, Iowa; Grand Rapids, Michigan; Minneapolis, Minnesota; Appleton, Wisconsin.

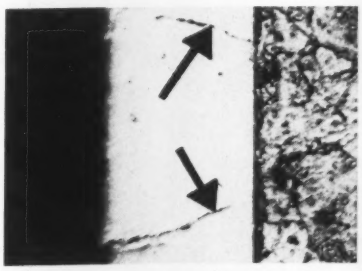
YOUR DEPENDABLE SOURCE FOR BOTH CARBON AND STAINLESS STEEL



The bumper guard on the left is plated with 700 millionths of semibright crack-free chromium direct on steel; the center piece has 50 millionths of bright crack-free chromium on nickel, and the last piece is coated with 700 millionths of the matte type chromium

Chromium Crack Free and Bright





Cracks in ordinary decorative chromium (below) extend to the base metal while the crack-free chromium has a continuous deposit (above)

Improved corrosion resistance is the most important characteristic of the deposit. It opens up new possibilities in the field of decorative plating

IN 1953, researchers at the Detroit laboratory of Metal & Thermit Corp. discovered a process for plating chromium which they described as crack-free. Although its utility was proved in the field, it had a disadvantage: The plate was whitish and satiny. This limited its decorative use to parts which could be buffed after plating.

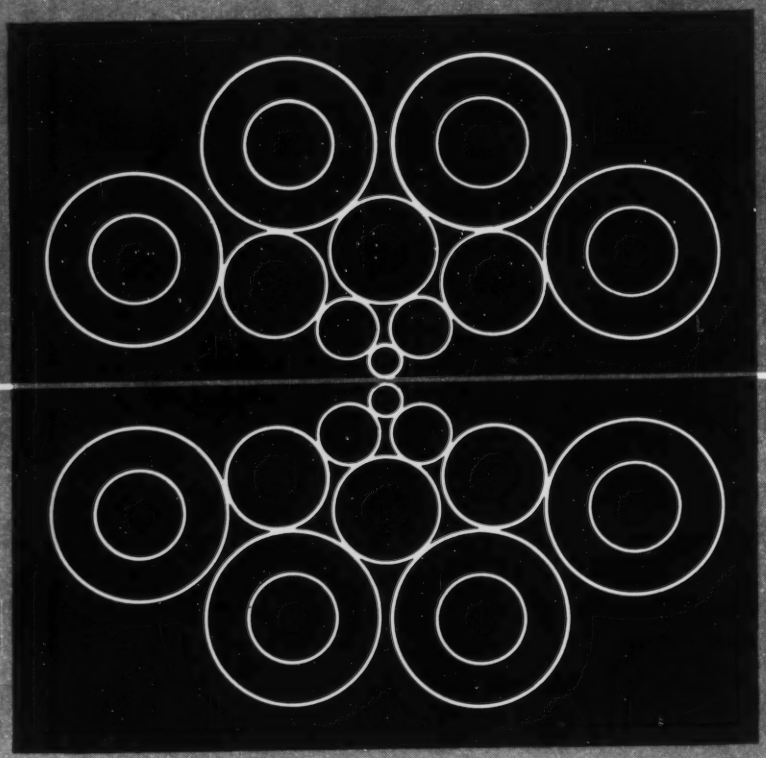
That shortcoming has been resolved, the company reported at the annual meeting of the American Electroplaters' Society in Montreal. The important crack-free property has been retained at no sacrifice to brightness. (Dr. E. J. Seyb presented the paper. A. A. Johnson and A. C. Tulumello were co-authors.)

Cost Advantages—Bright deposits can be produced with less intermediate plate (in some cases none is needed) to get satisfactory corrosion resistance.

The photograph above shows the appearance of steel bumper guards plated by this process. The mirror brightness of the center part shows the high reflectivity of the deposit.

Tests—Dr. Seyb reported that the crack-free deposit shows greatly improved corrosion resistance. Tests included: Exposure to the weather on the roof of the Detroit laboratory in a semi-industrial area, regular salt spray, accelerated acetic acid salt spray,

(*Please turn to Page* 177)



EASTERN PUTS THE SQUEEZE ON STAINLESS STEEL

SENDZIMIR-PRODUCED STAINLESS STEEL

now available in thicknesses down to .007″ and widths up to 48″

As the world's largest exclusive producer of stainless steel sheets and plates it is natural that Eastern would be among the first to produce stainless by the Sendzimir method.

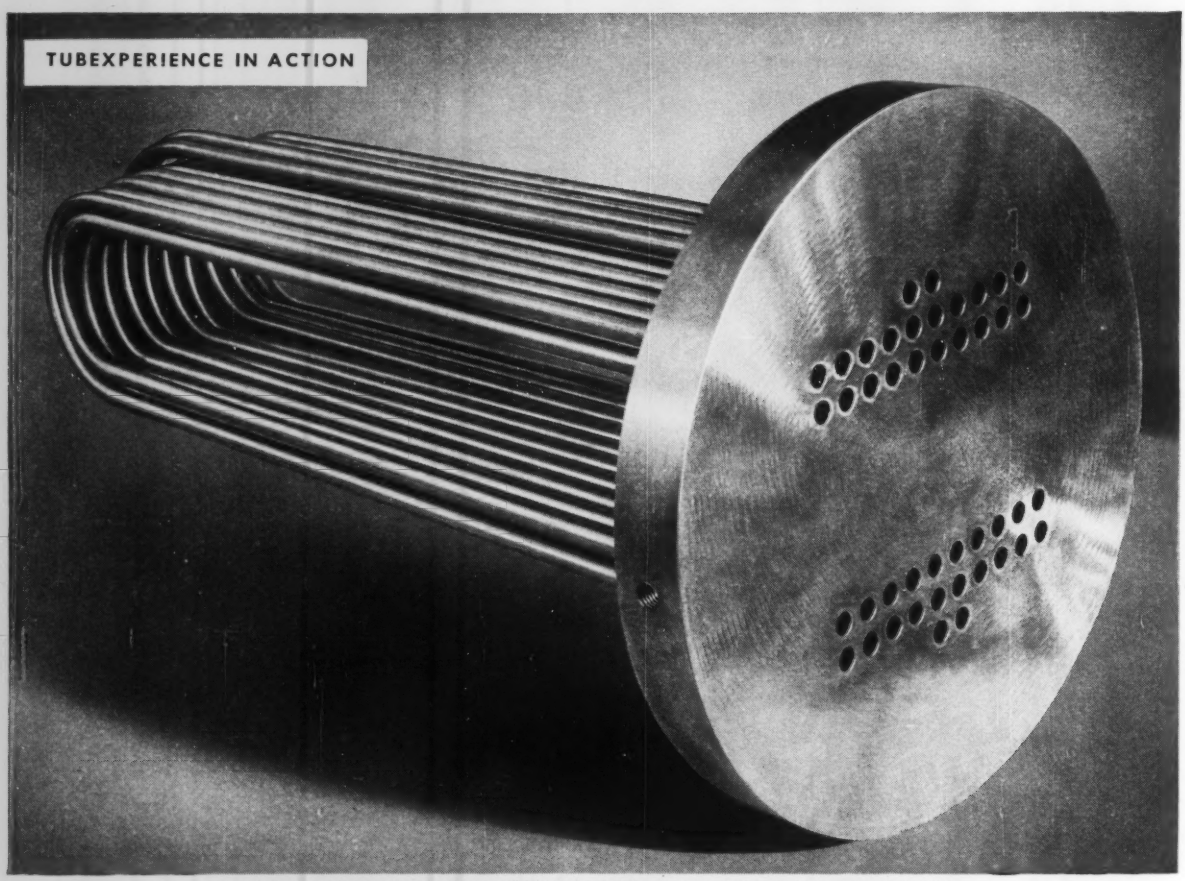
The unusual design of the Sendzimir mill with its small work rolls and series of force-transmitting back-up rolls removes many of the present limitations in the cold rolling of stainless steel.

Production from Eastern's new Sendzimir cold reduction mill rolls off the line in gauges and widths that until recently were impossible to obtain. Gauges held to extremely close tolerances are ideal for use in the supersonic aircraft and missile fields as well as broadly diversified areas in other fabricating industries.

Eastern invites you to explore new applications for the close tolerances and bright finishes of Sendzimir-produced stainless steels. Send for Eastern's new Specification Booklet or consult the Customer Service Department.

EASTERN STAINLESS STEEL CORPORATION

Baltimore 3, Maryland, U.S.A.



Heat exchanger tubing bundle ordered by a well-known chemical firm was fabricated by the Elyria, Ohio, plant of the Pfaudler Co. Superior supplied WELDRAWN* unalloyed titanium tubing, Grade A-40, with ¾ in. OD and .065 in. wall.

How Superior Titanium Tubing Beat a Corrosion Problem in a Heat Exchanger

Customer reports: "We chose titanium because no other material was satisfactory from the corrosion viewpoint. The results are excellent."

Fabricator reports: "The tubing supplied by Superior was just what we needed. And we found it would withstand a bend of 2½ in. radius without difficulty."

Chemical processing firms occasionally work with fluids so strongly corrosive that no tubing made from conventional materials can handle them. If you are confronted with such a problem you want titanium tubing by Superior.

Our unalloyed titanium tubing in Grades A-40 and A-55 has extremely high corrosion, erosion and cavitation resistance to a wide variety of corrosive agents.

Fabrication qualities are good, it is easy to flare and bend, and it can be spot-welded and brazed without difficulty. It is available in sizes up to 1⅛ in. OD in both seamless and Weldrawn forms.

Titanium is but one of over 120 different analyses available in tubing form from Superior. For complete technical information on Superior titanium tubing, get a free copy of Bulletin 44. Write Superior Tube Company, 2005 Germantown Ave., Norristown, Pa. *T M. Reg. U.S. Pat. Off., Superior Tube Co.

Superior Tube

The big name in small tubing

NORRISTOWN, PA.

All analyses .010 in. to ⅝ in. OD—certain analyses in light walls up to 2½ in. OD

West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif. • RAymond 3-1331

and the Corrodkote test.

Some of the steel panels were plated with copper under chromium, while others had both copper and nickel undercoats. Ordinary chromium was plated to a thickness of 20 millionths of an inch for optimum corrosion protection. This thickness was selected as the best because experience has shown that both thicker and thinner deposits give poorer corrosion resistance. Thicker deposits give poorer corrosion resistance because of cracking. This thickness range is also given in an ASTM specification as optimum for ordinary deposits.

The crack-free deposits were plated to 60 millionths of an inch because cracking didn't occur, and the deposits looked good at this thickness.

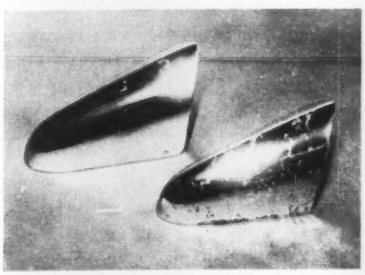
Results—In the accelerated tests, corrosion spots showed up on panels plated with ordinary chromium before the crack-free panels started to corrode.

The tests also showed that doubling the nickel thickness gives a marked improvement in corrosion results, but the improvement due to bright, crack-free chromium is more significant than the added nickel.

Another point brought out was that crack-free deposits with no nickel showed up better than ordinary chromium on copper plus nickel. This could be important when nickel is tight.

Reasons—Dr. Seyb attributes the improved corrosion resistance in

(*Please turn to Page* 180)



These pieces were treated in an acetic acid salt spray for 72 hours. The top piece is plated with 75 millionths of the crack-free chromium while the other piece is plated with 20 millionths of ordinary chromium. Ordinary chromium is not used in greater thicknesses because of the increased tendency to crack

A Conco engineered Crane is **top management's** idea of value. Quality like this means minimum maintenance cost, slow depreciation, tailored-to-the-job engineering, reduced accident hazards. Conco engineered Cranes reflect the more than 37 years experience that lies behind them. Write for bulletin 5000A covering the complete line of Conco cranes, hoists and trolleys.

FROM ANY VIEWPOINT

A FINER CRANE

CRANES HOISTS CONCO

CONCO ENGINEERING WORKS

Division of H. D. Conkey & Company 70-14th Ave., Mendota, Illinois

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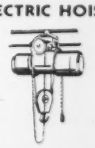
JIB CRANES

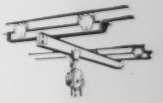
ELECTRIC HOISTS

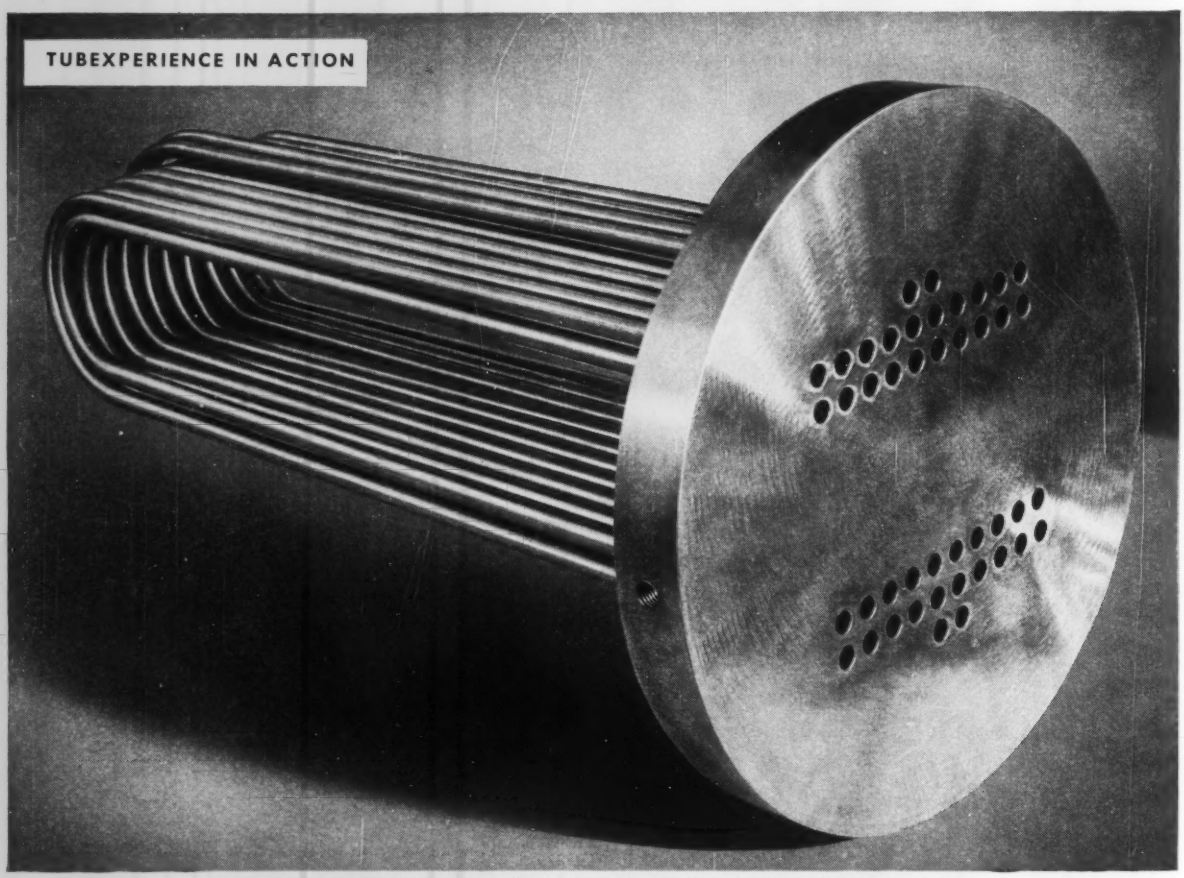


CHAIN HOISTS AND TROLLEYS

HAND GEARED CRANES

CRANE ASSEMBLIES





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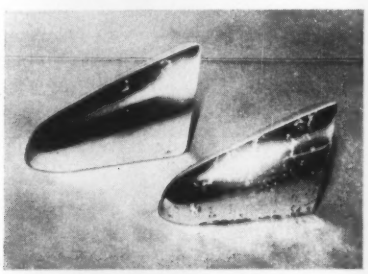

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A FINER CRANE

CRANES HOISTS CONCO

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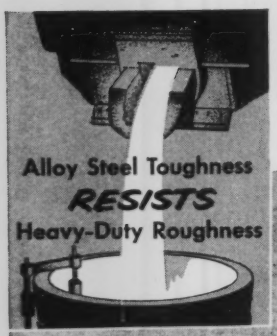
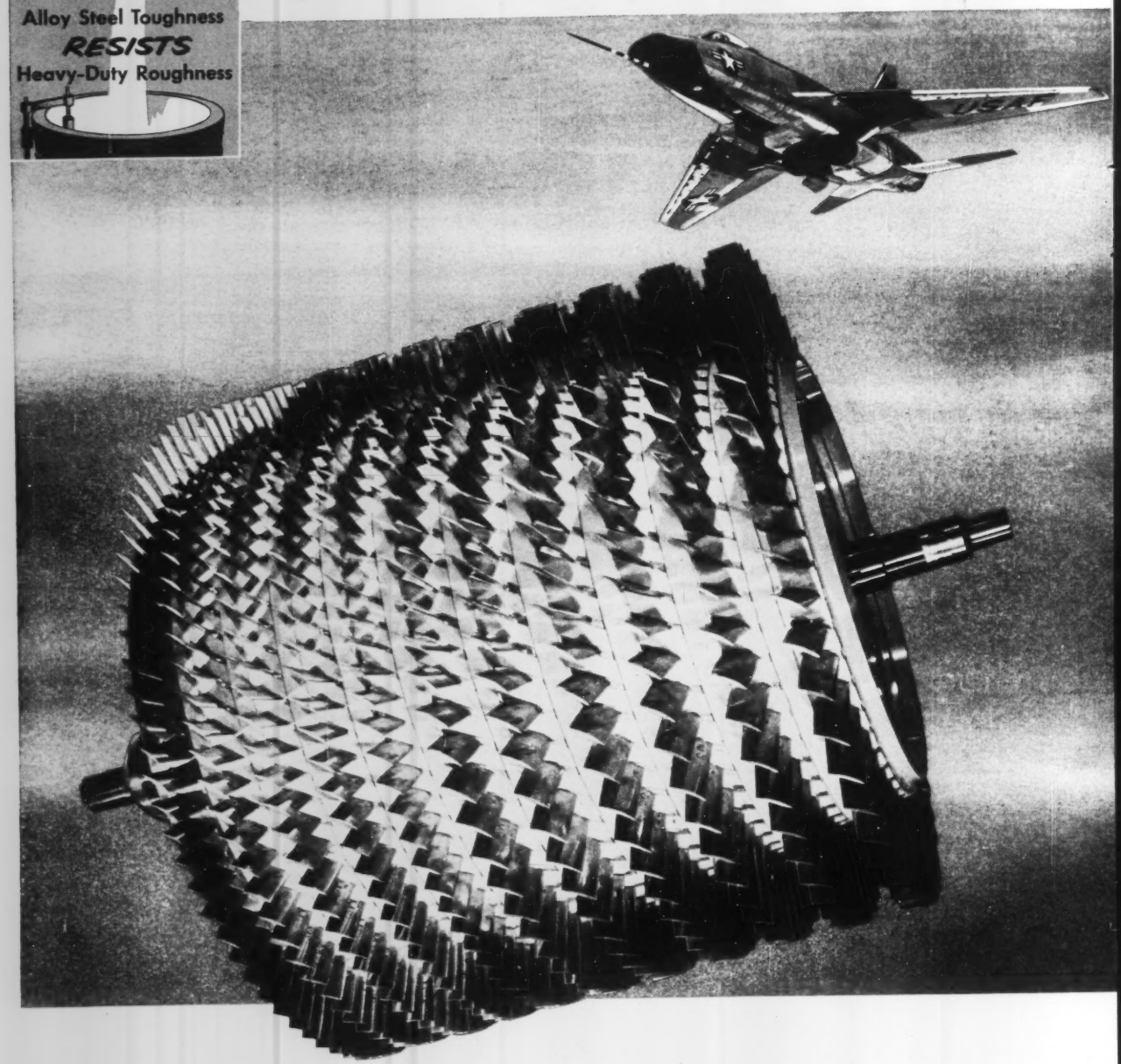


ALLOY STEEL PROVIDES HIGH



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World's Widest Range of Standard Steels

STRENGTH...DEPENDABLE TOUGHNESS

in Jet Engine Compressor Rotor Discs

Design the part to do the job safely—but keep weight down. Increase the ratio of horsepower to weight. Provide maximum resistance to fatigue. Maintain the strength of the part at wide temperature extremes. Whenever these design problems occur, alloy steels, such as Republic Hot Rolled AMS 6415 (AISI 4340), are given immediate consideration.

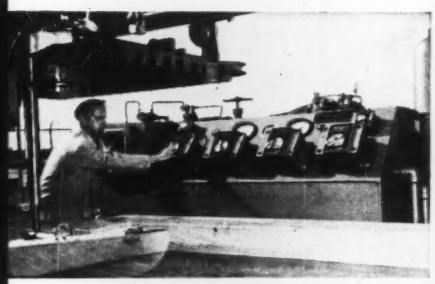
For in these fine steels are found the highest strength values—plus an exceptionally high strength-to-weight ratio that permits the design of thinner, lighter sections to save weight and hold down size without sacrifice of strength or safety.

These essential qualities of AMS 6415 were the basis for its selection for use in compressor rotor discs in Pratt & Whitney Aircraft's J-57 jet engine. The discs are machined from forgings by the Jet Division of Thompson Products, Inc. Forgings are supplied by Wyman-Gordon Company.

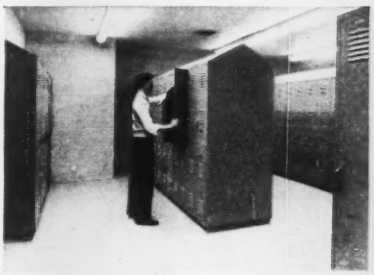
Still another reason for selection of this fine steel is its exceptionally good deep-hardening characteristics. Uniform response to heat treatment is assured—plus the production of hard, wear-resistant surfaces around tough cores.

Production, processing and development of aircraft alloy steels requires extremely close cooperation among the metallurgists of the part manufacturer, forge plant, and steel producer. The culmination of their combined effort provides the designer with a material for operating and structural parts that is free from excess weight, yet tough and strong to withstand shock, impact, stress and fatigue.

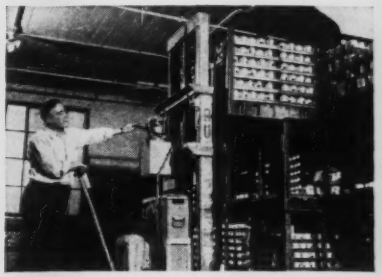
Republic metallurgists are always available to work with your personnel in applying these fine alloy steels to your product. The coupon is your invitation to use this confidential and obligation-free service. Mail it today.



TOUGHNESS TO WITHSTAND CORROSION, WEAR AND ABRASION make Republic Cold Finished ENDURO Stainless Steel Bars ideal for this seaplane hull testing device at Convair. Tests are conducted by suspending hull models from carriage which rolls on Republic Stainless Steel Bars. High tensile strength, close tolerance and a fine surface finish permit smooth, accurate operation of the testing device. Send coupon for more facts on Cold Finished ENDURO Bars.



TOUGH, BONDERIZED STEEL BASE provides the enameled finish of Republic Steel Lockers with protection from damage due to bumps, scratches, moisture. Bonderizing guards against the spreading of under-finish corrosion that causes flaking and peeling. Give employee morale a boost with handsome Republic industrial lockers. Three locking systems available. Our locker specialists offer complete planning and installation service. Mail coupon for illustrated booklet on types, specifications and prices.



TOUGH, STRONG REPUBLIC STEEL STACKING SKIDS speed piston handling at Thompson Products, Inc. Looking for a way to streamline handling operations and cut costs, Thompson contacted Republic. Joint effort of both companies' engineers produced the design of the PR-15 Stacking Skid, which was then fabricated by Republic's Pressed Steel Division. The result; Thompson enjoys faster, more economical handling in less space and with less equipment. Write for complete details.

STEEL

and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. C-4331
3120 EAST 45th STREET • CLEVELAND 27, OHIO

☐ Have an Alloy Metallurgist call.

Send more information on:
☐ Alloy Steels ☐ Cold Finished ENDURO® Bars
☐ Bonderized Steel Lockers ☐ PR-15 Stacking Skids

Name_____ Title_____

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the accelerated tests and in outdoor exposure to the absence of microscopic cracks (such as shown in photomicrograph for ordinary chromium).

They take the form of a fine network. Most workers in this field attribute the crack formation either to an increase in stress with increasing thickness or to weakness in the plate.

In thick chromium deposits (such as used in industrial plating), these cracks heal over. In the thinner deposits required for decorative plating, they give discontinuity and increased porosity through which corrosion products emerge.

Dr. Seyb said that the absence of crack lines both before and after etching crack-free deposits is conclusive evidence that the crack pattern of conventional chromium is not present.

The bath used to plate the deposit (called Unichrome Bright Crack-Free Chromium) is described as self-regulating. Chemical analyses are not needed.

Important constituents of the solution are automatically maintained at the optimum concentration. An excess of these materials lies undissolved on the bottom of the tank until needed to replace what is lost by dragout.

Balancing Act

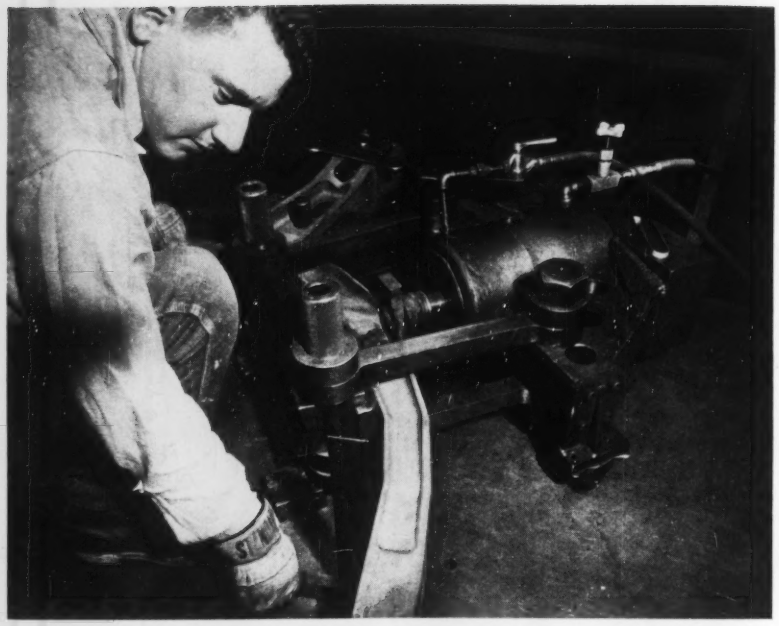
GM says it's improving engine quality in less time with this new portable instrument

AN ELECTRONIC device called the Pulse Synchronized Unbalance Indicator (PSUI), controls the balancing of General Motors' auto engines to closer limits than ever before.

Thomas C. Van Degrift, manager, special problems research, says that the device:

1. Improves the quality of engines.
2. Balances an engine faster than former instruments.
3. Simplifies detection routine.
4. Saves floor space.
5. Is portable.

Detectors are installed at the end of production lines next to run-in test stands.



Using a try square, operator checks part to template. If it's not right, cylinder bends part to fit. Later heat treatment assures high quality

Fixture Checks, Tests Plane Part

ONE of our country's most up-to-date fighters is safer because of a hydraulic testing system used at the Cleveland Pneumatic Tool Co., Cleveland.

The firm builds a Y-shaped tail frame for the plane. It is forged in three pieces, Kellered and flash buttwelded. The testing system checks dimensions, adjusts off-dimension parts and stresses the completed assembly to insure sound welds. It is almost 300 per cent faster than the old method.

Fixture — Cleveland Pneumatic used to lay the tail frame on a surface plate and check the part against a template. Discrepancies were marked and the part taken to a hydraulic press and pushed into shape. Several trips were needed to correct the part.

The new setup uses a portable hydraulic cylinder and throughbolts (see illustration). Realignment is completed without moving the part from checking position. Parts are brought to the surface plate and locked in position over the template with the throughbolts. Dimensions are checked manually against the template with a try tquare.

When the operator finds a discrepancy, the cylinder head is moved into position. Pressure is applied until the frame checks out with the template.

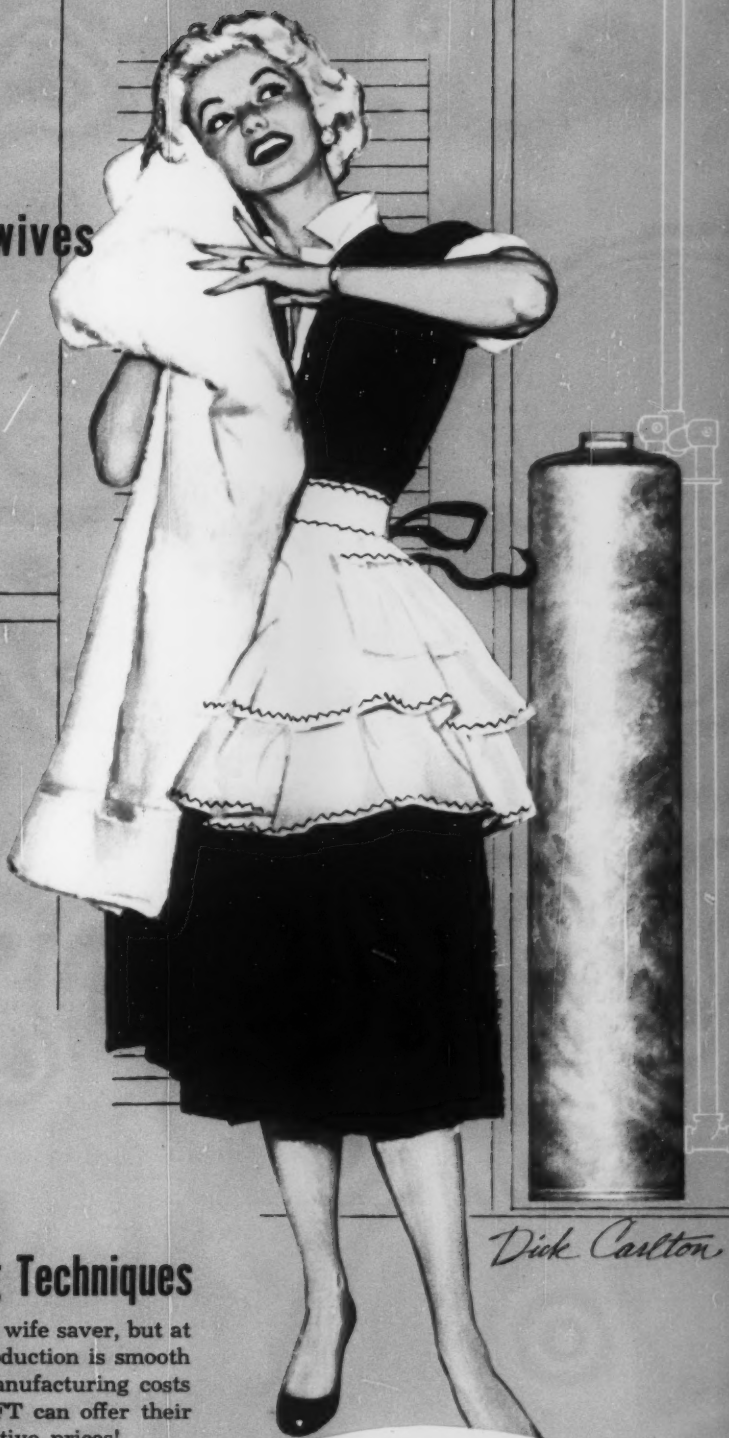
After adjustment, the tail frames are heat treated and rechecked for distortion.

Proof—For a final check of the welds, the frame is placed in a machine called the coat hangar proof test fixture. The bottom of the Y is attached to the cradle; the two arms are hooked to hydraulic cylinders. A load of about 18 tons is applied. The test makes certain the flash buttwelds will hold under stresses expected during flight.

Hydraulic pressure for both fixtures is supplied by a pump made by Denison Engineering Co., Columbus, Ohio.

Soft water saves wives

N. J. Cornwall, Ass't Gen. Manager, Tanks, Inc., manufacturers of galvanized water softener tanks.



This man saves money making water softener tanks with Sciaky Resistance Welding Techniques

Among wives, Norm Cornwall would be rated a wife saver, but at Tanks, Inc., he's a money saver because his production is smooth and almost completely trouble-free. And his manufacturing costs are so low that customers such as SERV i SOFT can offer their water softener rental service at really competitive prices!

Why don't *you* get the facts on how Sciaky resistance welding techniques can simplify your metal parts assembly and lower your unit costs at the same time . . . just as Mr. Cornwall did!

SCIAKY®

You can read the details of this application on the next page . . .

Resistance Welding Galvanized Steel

SCIAKY

HELPS PUT PROFIT INTO MANUFACTURING

The Economy of Seam Welding Galvanized Tanks in Limited Production

Questions frequently arise as to the practicality of resistance welding galvanized steel. However, Sciaky Resistance Welding Techniques have proved it can be done safely and economically.

The effect on zinc coating

In spot or projection welding the zinc coating remains intact when the correct Sciaky techniques are employed. In seam or flash-butt welding the zinc on the outer surfaces is removed. However, the corrosion resistance is easily restored by coating the surfaces with a priming paint such as aluminum in the way Tanks, Inc., does it. The efficiency of the Sciaky resistance welding process more than offsets the extra painting operation.

Seam welding galvanized tanks

In the Franklin Park, Illinois, plant of Tanks, Inc., Ass't Gen. Manager, Norm Cornwall, has developed a simple but efficient process for joining bottoms to shells in the manufacture of galvanized tanks.

A single operator, employing Sciaky resistance welding techniques, inserts the bottom in the shell, welds it, and restores the protective coating at a rate of 55 per hour.

The manufacturing sequence

Figure 1 shows the first operation in which the operator drives the bottom into the shell with a hammer. In actual practice he performs this operation and the third operation while welding is in progress.

FIG. 1 Operator inserting tank bottom into the shell.

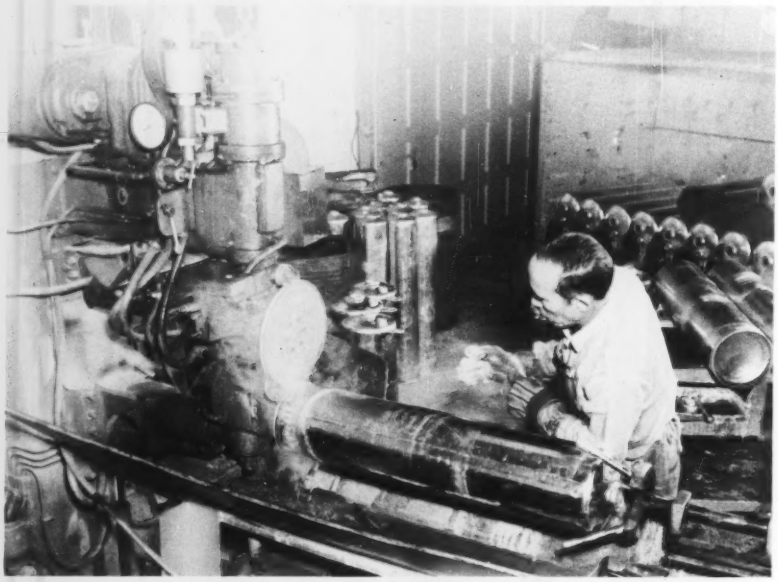


FIG. 2 Sciaky Seam Welder joins the bottom to the shell.

The second operation is the welding. The operator first makes a short (1″) tack seam weld on the side of the shell opposite the longitudinal seam of the tank.

The tack welded assembly is then placed in the Sciaky welder and clamped in position by an air actuated fixture. The weld is started adjacent to the longitudinal seam of the shell and the operator helps it over this enlarged section. After this the welding proceeds unattended at a speed of 37.5″ per minute with a spot spacing of 15 per inch. (See Figure 2). After completion of the full 360°, the operator allows the welder to continue and reweld over the longitudinal seam. This practice minimizes the danger of "leakers".

In the third operation the operator paints over the seam weld with aluminum paint to restore the corrosion resistance of the seam.

Information available

Case histories outlining the successful use of Sciaky Resistance Welding Techniques on galvanized material are available on request. An engineering report on resistance welding of galvanized steel is also available. Specific recommendations will be furnished on receipt of an outline of your requirements.

Write today, mentioning the information you would like to receive. There is no obligation. Sciaky Bros., Inc., 4932 W. 67th St., Chicago 38, Ill. POrtsmouth 7-5600.

DO YOU HAVE A RESEARCH PROBLEM?

Facilities of the Sciaky Research Division at Los Angeles, California, are available for contract research to answer resistance welding problems. Housed in a 15,000 sq. ft. building, these facilities include an experienced engineering staff, a complete range of the most advanced resistance welding machines including the largest in the world and a laboratory equipped for metallography, chemistry, electronics, photography and testing as applied to resistance welding. Write for further information and ask for the 20 page Research Division brochure.

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Tips on Shearing

Here's information from American Shear Knife Co. on selection, setting and care of knives

TO GIVE maximum tonnage per edge, a solid steel shear knife must be as hard and wear resistant as possible. It must not chip or break in use.

The edge must stay keen enough to shear without burring. In the case of hot shearing, knives must have red hardness and strength to resist heat checking.

Many Grades—Taking into account those requirements, and the variety of metals, shapes and thicknesses you shear, no knife can do all jobs well. You should choose one engineered to meet your needs. American Shear Knife Co., Homestead, Pa., tells its customers to consider these factors:

1. Kind of material to be sheared—mild steel, alloy steel, stainless or a nonferrous metal.
2. Thickness of material—average as well as maximum.
3. Temperature—whether material is sheared hot or at room temperature determines the choice of the basic alloy to be used.
4. Type service—continuous or infrequent.
5. Make and model of shear being used.

Knife Settings—One important factor governing knife life is care in adjusting settings. No standards can be given to fit all situations. Clearances for shearing the same gages will vary with the age and type of the machine.

In the absence of specific instructions, a clearance between knives of about 7 per cent of the thickness of the material being sheared is generally satisfactory.

Guides—On some shears, no change in knife clearance need be made for a change in gage. Clearance is generally set for the thinnest material to be sheared.

Most manufacturers will supply tables of suggested clearances for these knives. They are to be used as guides. The exact setting will have to be determined by trial.

Procedure—When setting knives in a guillotine shear, the upper one

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for the Steel Industry

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GREFCO PCO (plastic chrome ore) is an air-setting material available in several mixes of varying workability. After application by ramming it develops high strength and hardness upon air-drying. After firing it develops a dense hard surface which is unusually resistant to mechanical abrasion.

GREFCO PCO's chemical composition provides excellent resistance to attack by fluxes and slags such as roll scale, open hearth slag, and coal ash. Low porosity makes it highly resistant to penetration by molten metals or slags.

MAGNEHARTH is a ramming mixture made from dead-burned magnesite grains of high magnesia content, plus chemical bonding agents. When used in the bottoms of open-hearth and electric steel furnaces, MAGNEHARTH provides a highly refractory, stable, and long-lasting hearth. It can also be used with excellent results for resurfacing old bottoms, for forming tap holes, and for hot and cold patching in steel furnaces.

Consultation with a Grefco representative is recommended to be assured of the proper material for your service and conditions. He can furnish you with detailed instructions on the proper installation procedure, too.

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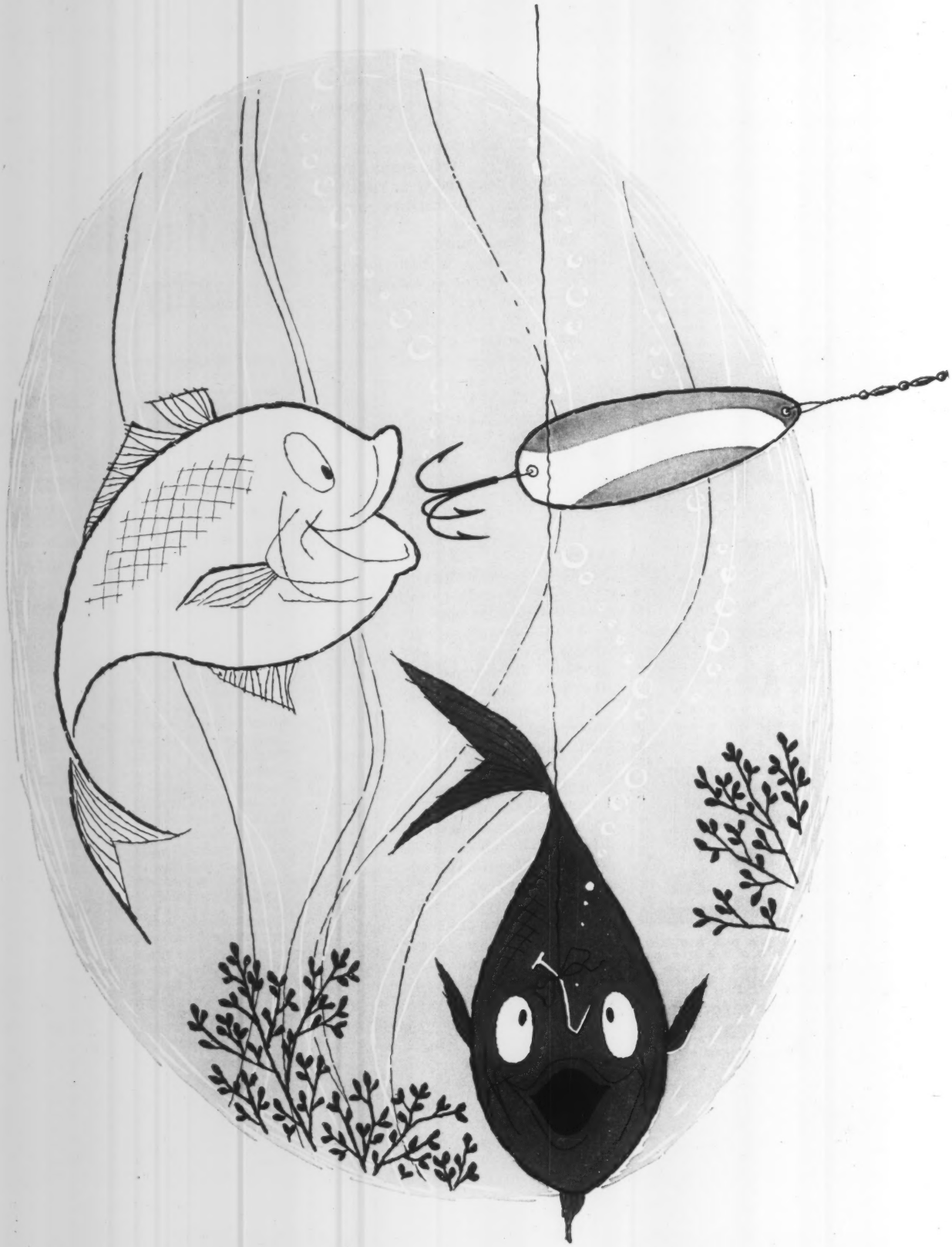
Philadelphia 2, Pa.



STEEL

wires that fish

In addition to wire for the traditional bent pins, CF&I-Wickwire makes a wire that's a real pro at fish catching. It's the special spring steel wire used to make fish hooks. Heat treated so it's soft and ductile, this high carbon steel wire can be severely deformed by fish hook makers, then heat treated again to give the finished hook a spring-like quality and hardness.

Chances are you don't need wire to make either pins or fish hooks. But *you may need one or more of the nearly 100 different categories of specialty wire for which CF&I-Wickwire is famous.* Let us show you how we can meet your most rigid chemical and physical specifications on high and low carbon wire in all sizes, shapes, tempers, finishes and grades.

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Bobby Pin Wire
Bookbinder Wire
Brush Wire
Casing Wire
Cotter Pin Wire
Curtain Spring Wire
Die Spring Wire
Gutter Broom Wire
Lock Spring Steel
Rake Tine Steel
Regulator Spring Wire
Snake Fishing Steel
Stapling Wire for Preformed Staples (Flat)

LOW CARBON FINE AND SPECIALTY WIRE
Bee Wire
Bonnet Wire
Bookbinder Wire
Broom Wire
Clip Wire
Dent Spacer Wire
Drapery Pin Wire
Florist Wire
Fuse Wire
Glass Netting Wire
Hairpin Wire
Hook and Eye Wire
Mattress Wire
Picture Cord Wire
Picker Tooth Wire
Pin Ticket Wire
Pin Wire
Ring Traveller Wire
Spiral Binding Wire
Stapling Wire
Stapling Wire for Preformed Staples
Stone Wire
Weaving Wire
Weaving Wire for Fly Screen Cloth
Wissco Iron Wire

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Armor Wire
Belt Hook Wire
Bobbin Ring Wire
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Chrome Vanadium Spring Wire
Core Wire (Aluminum Cable Steel Reinforced)
Curtain Spring Wire
Flexible Shaft Wire
"Gamma" Spring Wire (Upholstery Spring Wire)
Zig Zag Wire
No-Sag Wire
Hat Wire
Heddle Wire
Hose Reinforcement Wire
Hose Wire, Mechanical
Hose Wire, Vacuum and Defroster
Rope Wire
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Spoke Wire
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Tire Bead Wire
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4240

TIPS ON SHEARING . . .

should be put in first. Use a wooden lever to wedge it tightly against the knife seat. Make sure all bolts are in place and tight.

Next, place the lower knife with the cutting edge even with the top of the table. Lower the upper one by rotating the flywheel until the knives cross.

Adjustments—Using the table adjusting screws, move the knives so a 0.010 in. feeler gage will go between them. Use knife adjusting screws or shims to make them exactly parallel.

When the knives are parallel, move the table in or out to the required clearance and bolt it tightly in place. Recheck the clearance with the feeler gage.

Flying Shear — When setting knives in a flying shear or a scrap chopper, use slightly closer tolerances than for guillotine shears. Be sure knives do not clash during operation.

Before installing knives in any shear, they must be accurately ground, demagnetized, cleaned and deburred.

Rotary Shears—Both horizontal and vertical clearances (overlap) are important in setting rotary shear and slitter knives. They must be considered together because one affects the other.

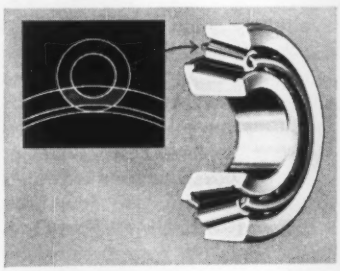
Again, you should go to the knife manufacturer for suggested clearance settings as reliable starting points. Such variables as arbor deflection, slitter speed and quality of slit edge required make it impossible to determine exact settings, except through trial.

Method—The horizontal settings are made first and with great care. Good practice demands that the knives be accurately ground, that the spacers and nuts be smooth, free from nicks and accurate. The reason: When spacers are tightened against the knives, they will not throw them out of the true vertical plane.

When setting up slitter arbors, it is essential that the knives and spacers be clean and dry. The upper arbor should be raised so the knives will pass each other freely. Then the slitter knives and spacers can be set up.

In This Order—A knife (A) is placed on the top arbor against

Bearings "keep cool" under hot steel!



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Watch it! Coming down the line—another half-formed slab of red-hot steel! And with it comes a supreme test of bearing excellence. Bower Bearings are equal to it—helping to keep this mill operating smoothly and continually despite heavy loads and extreme temperature. Whatever the job, there's a Bower Bearing engineered to perform just as dependably when the going is toughest. Rigid quality controls and basic bearing design refinements like those shown at the left have reduced Bower Bearing failure to a practical minimum. If your product uses bearings, specify Bower! There's a complete line of tapered, straight or journal roller bearings for every field of transportation and industry.

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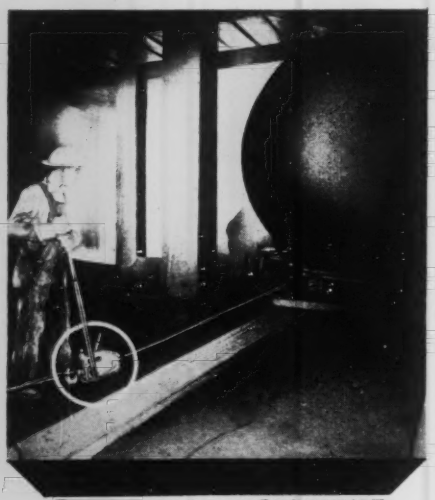

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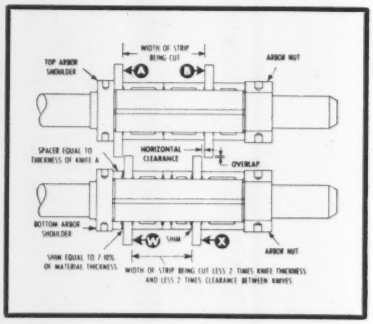


TIPS ON SHEARING . . .

the inboard shoulder. A spacer equal to the thickness of the knife is put on the bottom arbor against the arbor shoulder. To privide horizontal clearance between the top and bottom knives, a shim equal to 7 to 10 per cent of the thickness of the material to be cut is added to the spacer on the bottom arbor.

A knife (W) is put on the bottom arbor. Spacers exactly equal to the width of the strip to be cut are placed on the top arbor and a second knife (B) is added to the top arbor.

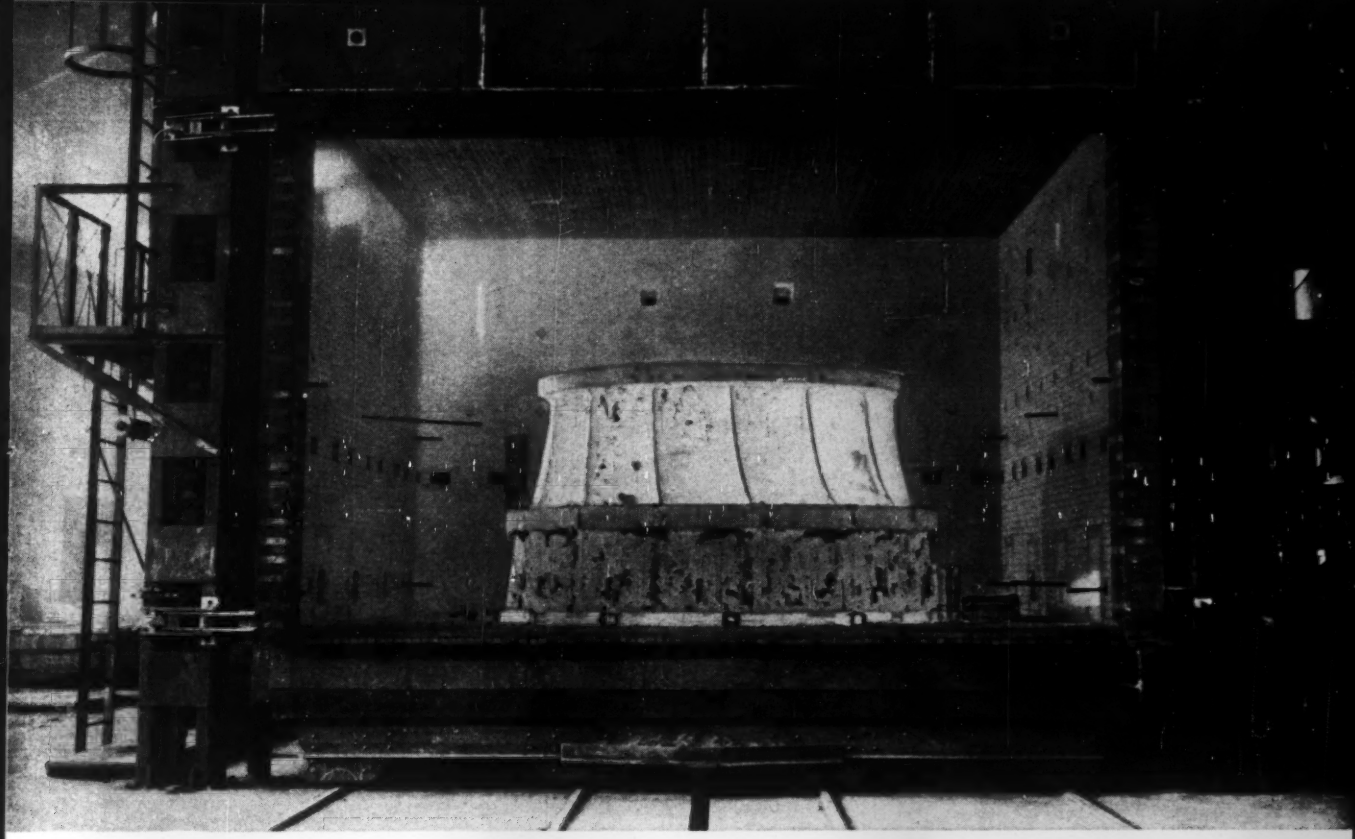
On the bottom arbor, spacers equal to the width of the strip to be cut, minus the thickness of the two knives (W and X) and minus twice the clearance, are added. A second bottom knife (X) is then put on the bottom arbor.

Put spacers on the outboard ends of the arbors extending slightly beyond the outboard shoulders. Screw arbors nuts on lightly, lock the outboard housing in position and tighten the nuts.

Clearance—Bring down the top arbor so the knives overlap and check the clearance with a feeler gage in at least four positions around the circumference of the knives. It may be necessary to readjust side clearance between knives. This can be best done with shims.

If the same widths and gages are slit frequently, or if extreme accuracy in slitting is required, special spacers manufactured to include width of strip and knife clearance can be used. They will reduce setup time and insure more accurate settings.

Overlap—In adjusting for vertical clearance, set the arbors so the knives are neither overlapped



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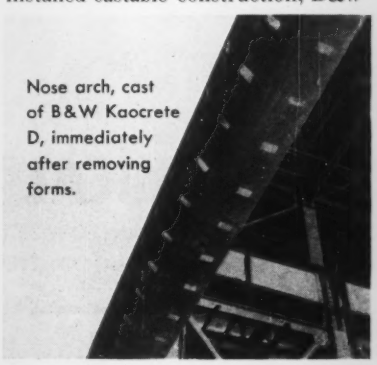
Engineering a furnace lining with *specialized* refractories can save dollars on construction, fuel and maintenance as well as extend productive working time. To achieve these results, seven different B&W refractories were used in the lining of this 25′ x 23′ x 14′ annealing furnace.

Fuel savings and close temperature control were made possible by using three types of *lightweight* B&W Insulating Firebrick. Walls are composed of *B&W K-23 IFB* backed up with *B&W K-16*. Because of the proximity of the burners, the roof was constructed of *B&W K-26 IFB*, a higher temperature brick to guard against the effect of possible localized overheating.

The weight saving construction means about 100 lb less refractory material to heat up per sq ft than with ordinary firebrick, or about 28 tons less in the roof of the furnace. Furthermore, supporting steel is less massive, far less costly. Commercial size steel can be used for roof suspension instead of special steels.

To eliminate the need for expensive special shapes, the burner tunnels are formed of *B&W's 3000 F refractory castable, Kaocast*. Lintels over the burners and jambs are constructed of rugged *B&W Junior Firebrick*.

To take advantage of fast, easily installed castable construction, *B&W Kaocrete-D* was used in the nose arch (separately pictured). This sturdy castable with a 2500 F use limit was selected to provide strong resistance to abrasion caused by door operation. In addition, the need for costly fired shapes and their supporting castings was eliminated, as was a great deal of expensive engineering detailing.



Nose arch, cast of B&W Kaocrete D, immediately after removing forms.

The car top is insulated with *B&W Kaolite-20*, a 2000 F insulating refractory concrete.

For further information, write for B&W bulletin R-2-H on insulating firebrick and B&W bulletin R-35 on castables.

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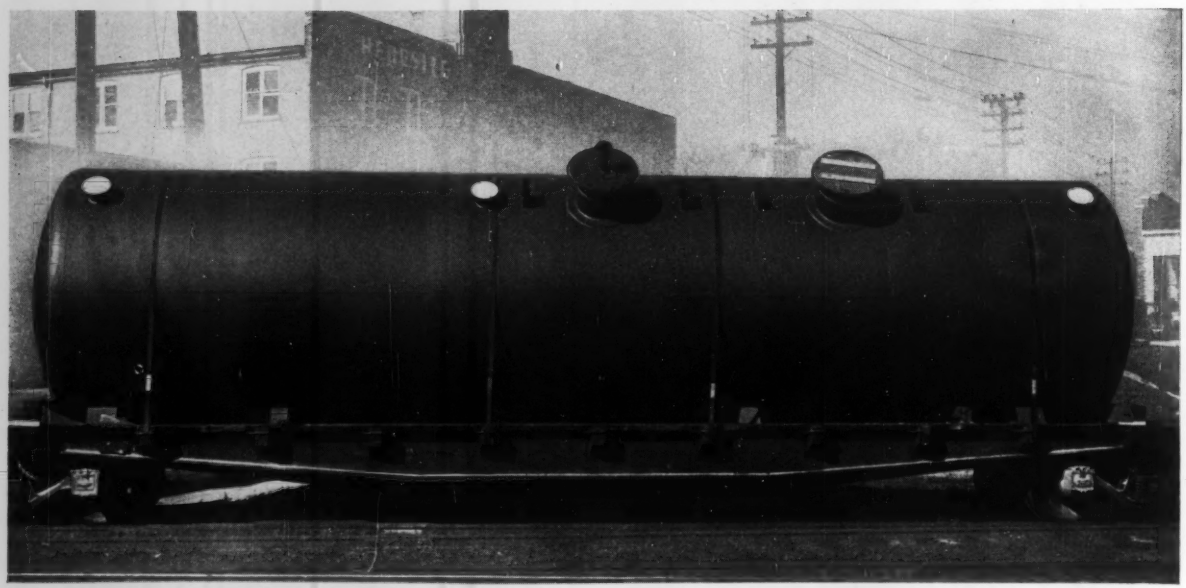

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nor separated. After the material is fed into the slitter, the knives are overlapped until they begin to cut.

It is common practice to have the knives overlap about one-quarter to one-half the thickness of the material for thicknesses less than 0.062 in. As the gage increases, the overlap decreases. For 3/16-in. material and heavier, the knives are usually separated vertically. Use as little overlap as possible to increase knife life.

Operation—For the best quality cut and the least burr, proper and adequate guides or holddowns must be used. Generally, some device next to the knife is the most successful. Solid steel holddowns are sometimes used and ground on the outside diameter.

A relationship exists between the holddown and the knife diameter—usually ¼-in. difference in the diameters. Brass slides are often used, or rotating wooden or rubber wheels. The strip must be guided into the knives and held firmly in the pass line while being slit.

Lubrication—To reduce the effects of friction and pickup, as much oil as possible should be used on the knives. Recommended: A mist lubricator mounted on the side trimmer or slitter.

Knives being used together should be matched for size on the outside diameter to give identical surface feet for the same number of revolutions. Knife speed should be carefully synchronized with strip speed to reduce the effects of friction and pickup.

Grinding — Proper grinding of knives is important in life and usage. A constant threat to high alloy knives is destruction through improper grinding. Soft, free cutting grinding wheels operated at about 5000 sfpm are a necessity. The table of a knife grinder should operate at 70 sfpm minimum.

When using knives on or near continuous pickling lines, there is a tendency to store spare knives near the trimmer or acid tanks. The knives must be protected by grease coatings, plastic dip coatings or immersion in oil. Even a slight amount of acid fumes will damage the cutting edge and cause an early failure.

Rocker Dumps

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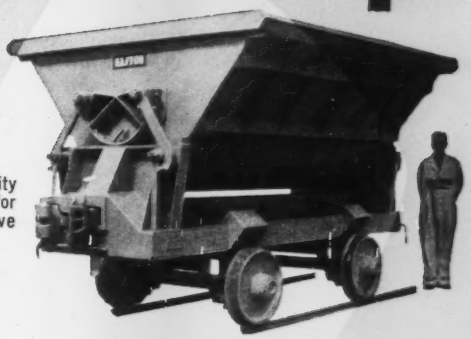

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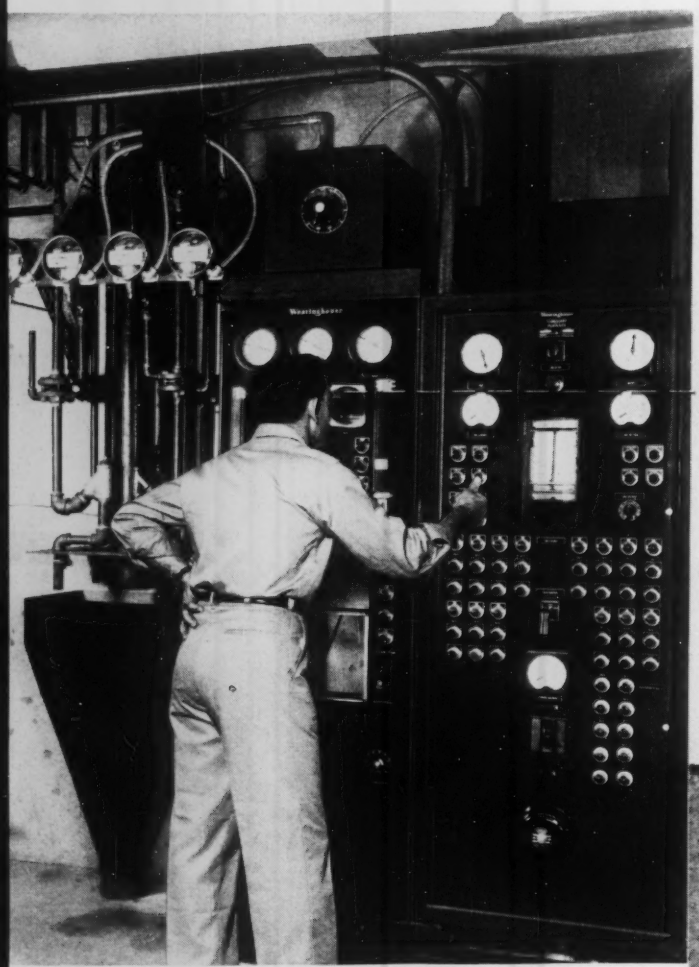
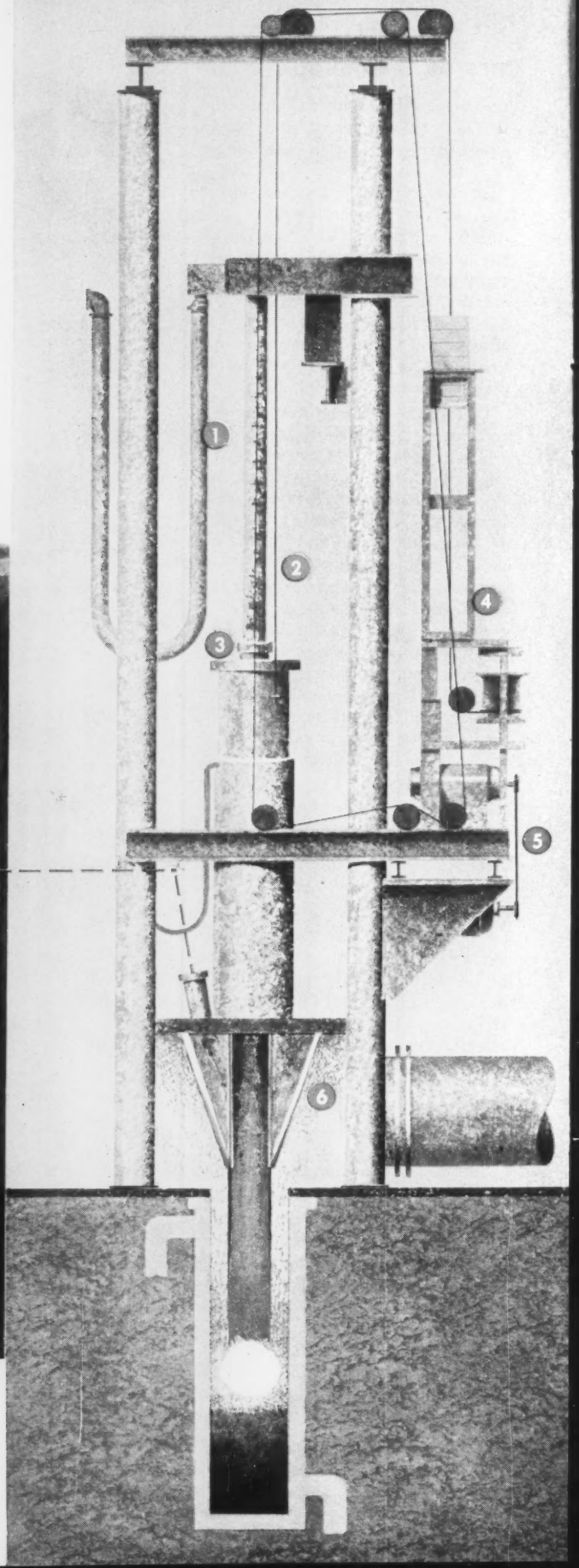


Automatic control panel sequences and monitors vacuum arc furnace operation. Built-in optical system allows operator to observe melting progress.



Westinghouse installs largest vacuum arc furnace at Carborundum Metals Company

Tough requirements for melting large, zirconium ingots have been minimized at Carborundum Metals Company by a new Westinghouse vacuum arc furnace. This furnace produces 8″ or 12″ first-melt ingots and 12″ or 16″ double-melt ingots up to 2200 lbs. Top metallurgical functioning results from careful design and construction.

Furnace design is backed by extensive vacuum chamber research. This work developed methods for controlling the action of an arc in high vacuum. At Westinghouse Metals Pilot Plant these laboratory conclusions were scaled-up in production size melts. Ingot analysis verified furnace design and operating procedure.

Careful attention was given to electrical and mechanical components, too. Power cables are permanently connected for positive electrical contact. Electrode movement is governed by positive downward drive, and a positioning mechanism guides the electrode on true center. All drive components are externally mounted for easy inspection.

Capable of every step from research to equipment manufacturing, Westinghouse can be a single source for *your* vacuum metallurgy needs. It's another example of the way Westinghouse helps you POWER-UP . . . to get better production and profit from your electrical dollar. Talk it over with your Westinghouse Industrial Heating representative or write Westinghouse Electric Corporation, Industrial Heating Division, Meadville, Pa.

J-10465

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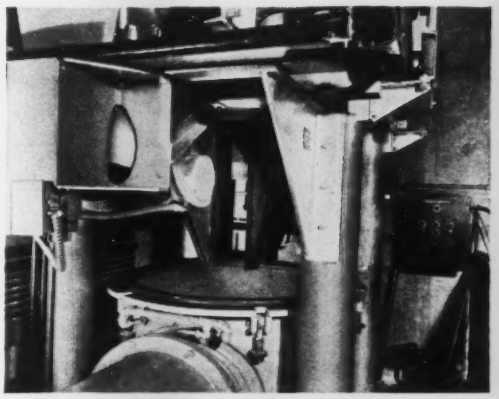
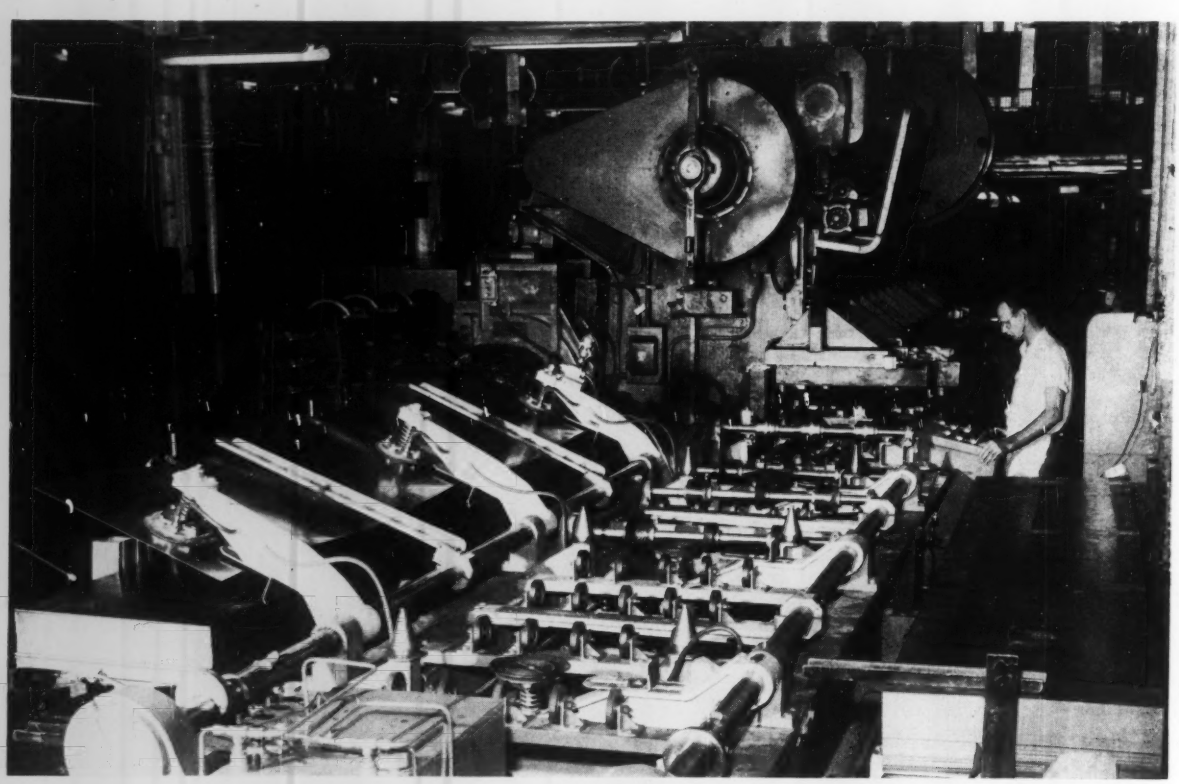
Westinghouse



Accurate electrode centering is maintained by fixed guides; sound construction provides added safety.

Sturdy ingot molds, ranging from 8 to 16 inches in diameter afford simple installation . . . large cooling water connections . . . arc stabilization connections.



Loader operates from alternate sides. Combination of vacuum cups, magnetic bars and air jets starts sheets on their way

Frigidaire Makes Cabinet in 38 Seconds

THE new production line at Frigidaire's Dayton, Ohio, plant completes a refrigerator cabinet every 38 seconds—an increase of 40 per cent in output per manhour.

The first of four such lines, it's part of a plant-wide program to upgrade production methods. Beyond that, it may be the forerunner of a method to automatically assemble auto bodies.

W. L. McCarthy, works manager, has this to say about the modernization: "We are taking full advantage of technological progress. Advanced production methods will help us maintain leadership in appliances and achieve our objective of building better products."

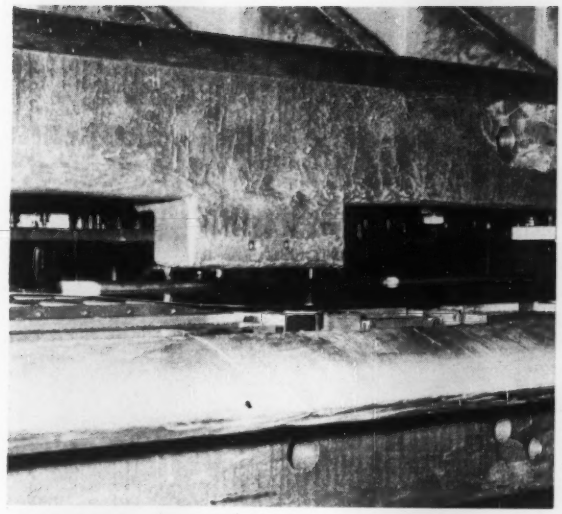
Here's how the cabinets are assembled.

Destacker—Frigidaires come in five sizes. Sheets for them are 0.036 in. thick and 23 or 24 in. wide. Length depends on cabinet size.

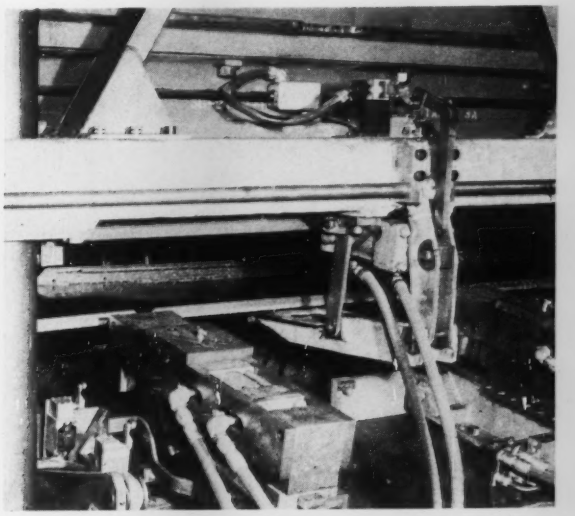
Stacks of sheet stock are hand trucked to both sides of a Struthers Wells loading unit. Arms equipped with vacuum cups lift sheets from alternate piles and place them on the loader bed. Magnets and a blast of compressed air help separate sticky sheets and prevent loading more than one sheet at a time.

The loader rolls sheets into a blanking press automatically.

Built-In—The lower half of the blanking die is fitted with twin roller conveyors. The blank moves on the rollers until it hits automatic stops. Just before the press closes, the roller conveyors retract, plac-

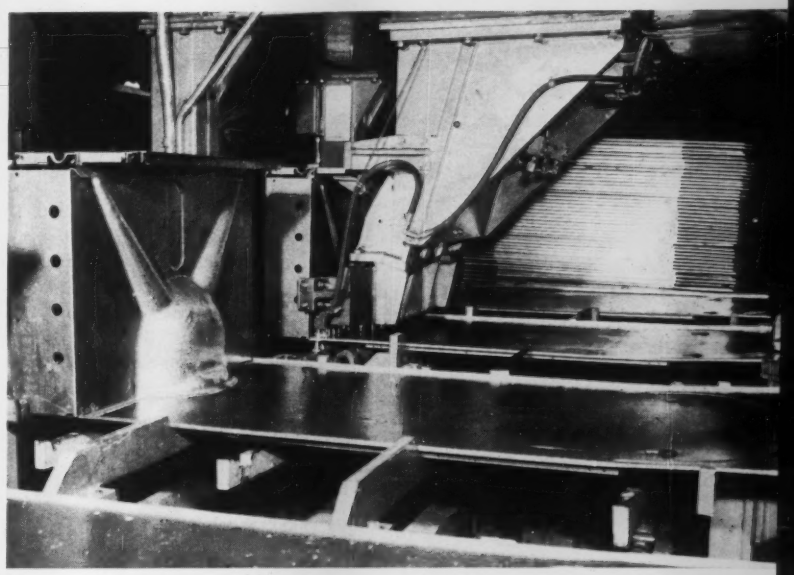


Close-up of the blanking die. Rollers retract on the down stroke. Blank is shown on the way to Yoder roll



After roll forming of flanges, this machine offsets notches to prevent interference

Combining new and old equipment with improved material transfer simplifies a problem of modernization. Here's a description of how operations are integrated



Backs and bases are placed on the conveyor beyond Taylor-Winfield welder. Completed subassembly moves to the front automatically for transfer to Struthers Wells bender

ing the blank in position on the lower die half.

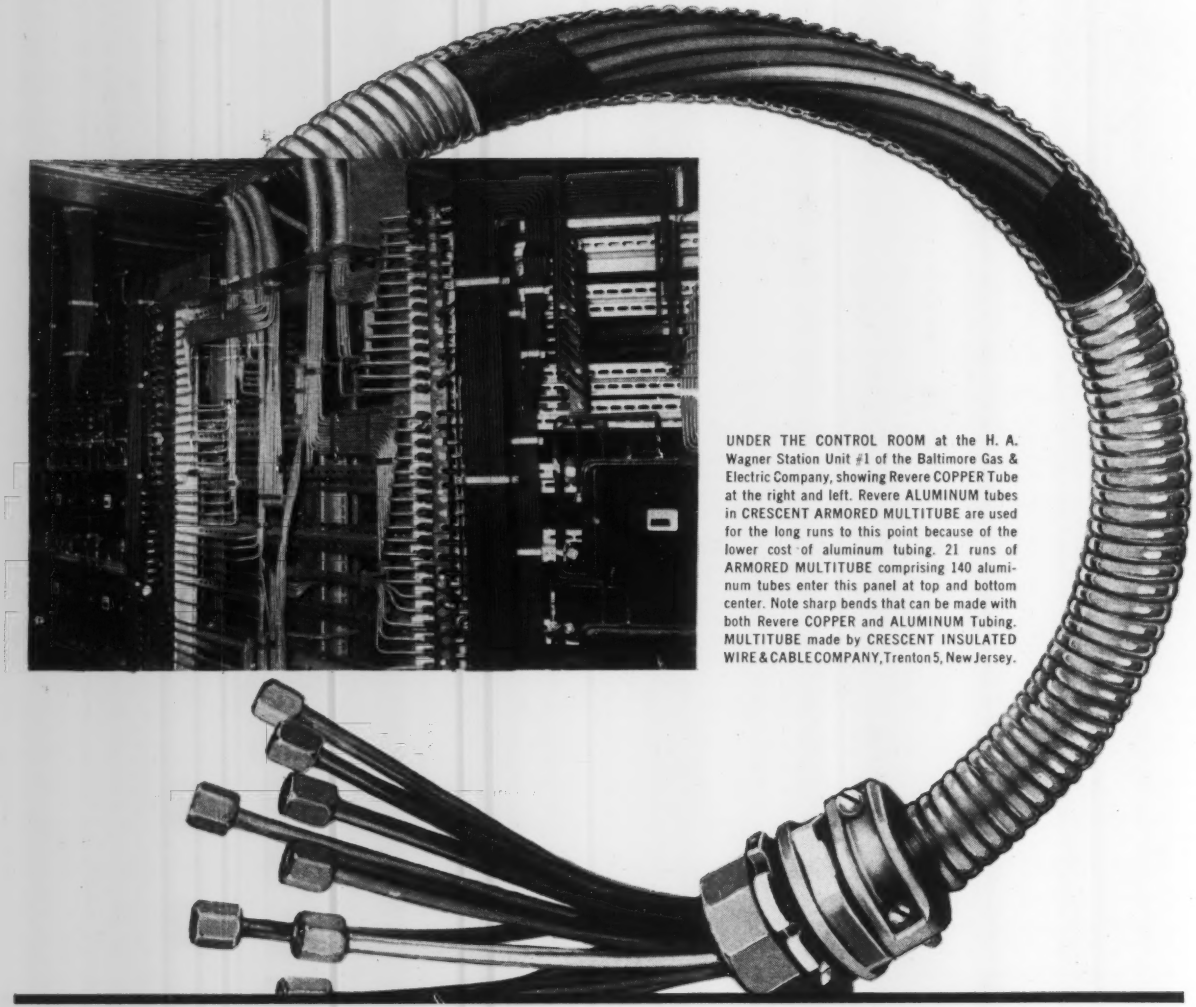
After the blanking stroke, the rollers return the blank into position for the ejector. It pushes the blank onto a roller conveyor which feeds an 18-stand Yoder roll.

The roll former bends the sides into flanges, one of which requires a double-reverse forming. Sheets and rolls are lubricated with soluble oil.

Offset—Notches are punched in the blank at the bend lines. To keep the notch edges separated during bending, hydraulic dies offset them. An elevator, which is part of the offsetting machine, lowers the flanged blank to the input level of a Struthers Wells bender equipped with a Taylor-Winfield spotwelder.

Subassembly — Stamped bases and backs for the cabinets are assembled and spotwelded in a Taylor-Winfield. They move automatically into the Struthers Wells bender-welder for assembly with the single-piece flanged blank which forms the top and two sides (see illustration, top of Page 197).

Cabinets are formed and spotwelded upside down. The floor plan of the Struthers Wells bender-welder resembles a T. The flanged blank for the top and two sides forms the cross; the subassembly, the leg. The first operation moves the subassembly into a vertical po-



UNDER THE CONTROL ROOM at the H. A. Wagner Station Unit #1 of the Baltimore Gas & Electric Company, showing Revere COPPER Tube at the right and left. Revere ALUMINUM tubes in CRESCENT ARMORED MULTITUBE are used for the long runs to this point because of the lower cost of aluminum tubing. 21 runs of ARMORED MULTITUBE comprising 140 aluminum tubes enter this panel at top and bottom center. Note sharp bends that can be made with both Revere COPPER and ALUMINUM Tubing. MULTITUBE made by CRESCENT INSULATED WIRE & CABLE COMPANY, Trenton 5, New Jersey.

CRESCENT relies on REVERE

for dependable performance of its instrumentation and control tubing

REPORTS, "NOT ONE FAILURE."

The dependable performance of Revere Copper Tube in Crescent Armored Multitube*, ever since its inception, has led the CRESCENT INSULATED WIRE & CABLE COMPANY to fill its aluminum tube needs with Revere also.

In fact, Crescent, since it first started using Revere Copper Tube in 1953, reports not a single failure. And that's mighty important in instrumentation and control tubing service where utilities, chemical processing, petroleum, paper and similar industries can't afford the luxury of process failures.

Crescent Multitube, using either Revere Copper or Aluminum Tube, or both in combination, offers a completely protected installation for permanence, lower original installation cost, lower maintenance and a saving of time, space and money.

Crescent Armored Multitube consists of a group of Revere Copper or Aluminum Tubes, twisted together in cable form, protected by a flexible interlocked galvanized steel armor. Constructions are available employing plastic sheaths in combination with the armor for corrosive locations. Section of cabled tube pictured shows how Copper or Aluminum Tubes are encased inside the Armored Multitube. As many as 37 tubes of ¼" OD can be cabled in lengths up to 1,000 ft.

For details on Multitube write Crescent and for uniform quality copper and aluminum tube, speedily delivered, see the nearest Revere Sales Office.

*Reg. Trademark

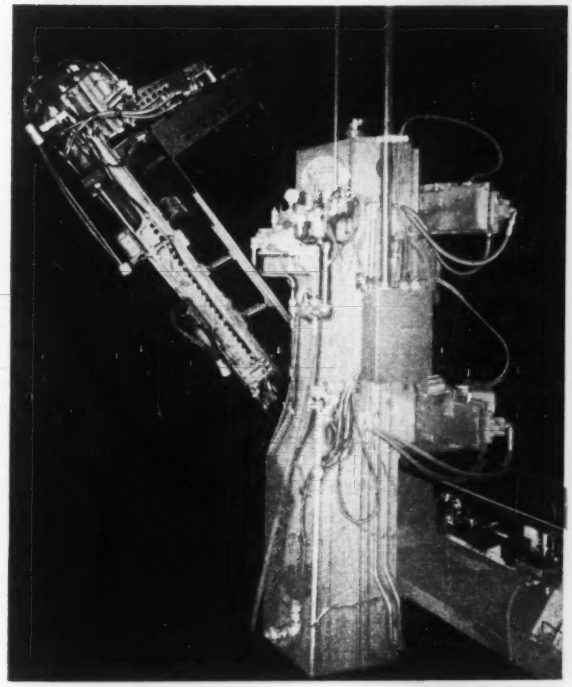
REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

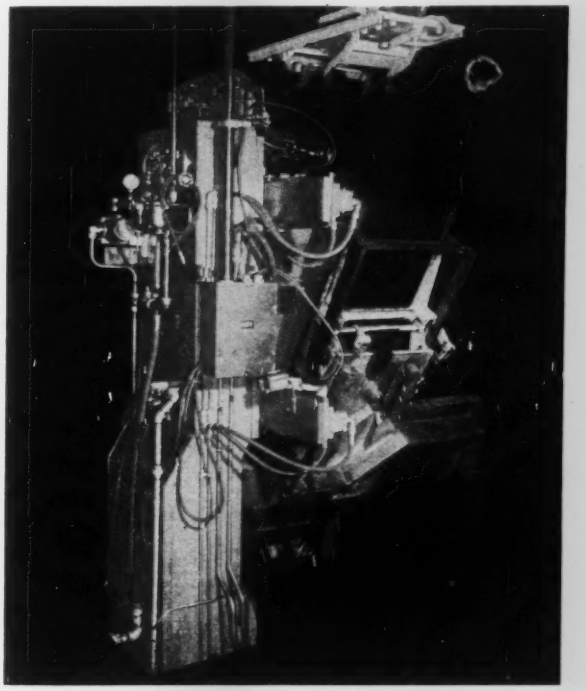
230 Park Avenue, New York 17, N. Y.

Mills: Rome, N. Y.; Baltimore, Md.; Chicago, Clinton and Joliet, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Brooklyn, N. Y.; Newport, Ark.; Ft. Calhoun, Neb. Sales Offices in Principal Cities, Distributors Everywhere.

COPPER • BRASS • 1801 • REVERE • ALUMINUM



This bender is the heart of the cabinet line. Sheet which forms top and sides moves in at the bottom. Back-base subassembly moves in from left and is raised to vertical



Sides are bent up last and spotwelded to back and base. Tong carriage for transfer to final spotwelders is shown at the top (right)

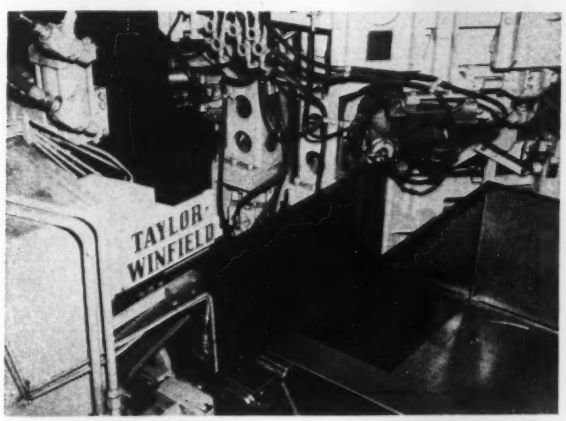
sition with the base at the top. The second bends up the sides of the flanged blank to match the edges of the base and back. Flanges along the edges are spotwelded to hold the cabinet for final spotwelding.

The bender-welder retracts and overhead tongs pick the formed shell out of the bender and move it to a downender which places the shell on its back. Conveyors move the shell through the final Taylor-Winfield spotwelders.

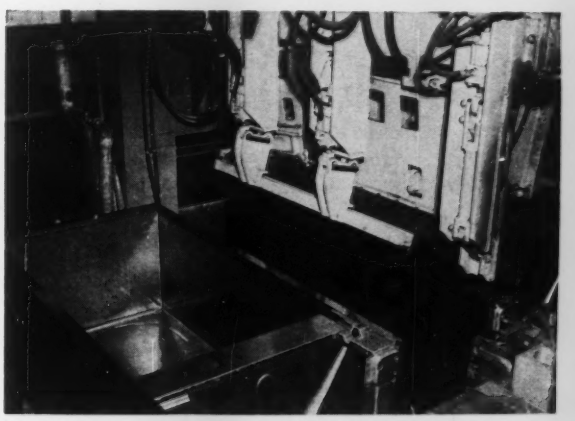
Completion — The first one roll seam welds the front corners, mash seam welds the rear corners and completes the spotwelds between the back and top, and the bottom and side. The last machine finishes the spotwelds joining the sides to the back.

Completed cabinets pass from the automatic spotwelders along conveyors to the metal finishing line. Degreasing, phosphate coating and painting follow.

All operations (including loader, blanking press, roll former) are electrically co-ordinated. Limit switches prevent jam-ups. Each machine has individual controls for setup.



These two spotwelders complete the joining of cabinets. Electrodes move in and out of cabinets automatically



Transfer conveyors carry completed cabinets through line to metal finishing

Quality of Stainless Steel Bars Improved with New Type Furnaces

Faster, Shorter, Heating Cycles Permit Finer Control in Heat Treatment

Modern, continuous furnaces have been installed by the Stainless Steel Division, J & L Steel Corporation, to insure the production of the highest quality stainless steel bars.

Furnaces (illustrated at right) that feature the Duradiant Burner, "focus" radiant heat so that it can be uniformly diffussed and transferred without flame impingement. The result is a faster, shorter heating cycle. This, in turn, results in reduced oxidation.

These Selas furnaces will handle bars up to 4½" in cross section and lengths up to 30 feet.

Roller-Hearth Furnace Handles Wide Range of Sizes

The batch-type, roller-hearth annealing furnace (illustrated below) can handle a wide range of bars from ½" to 4⅜". This 153-foot furnace will accommodate bars up to 36 feet in length, or several skids of coils to supplement other coil annealing furnaces.

These new facilities contribute directly to the kind of production flexibility that the Stainless Steel Division has designed into their combination mechanical and hand mill operation. A flexibility that enables them to supply the great variety of quality stainless steel products required by their customers.

Write or call today for our latest stock lists.

JL STEEL

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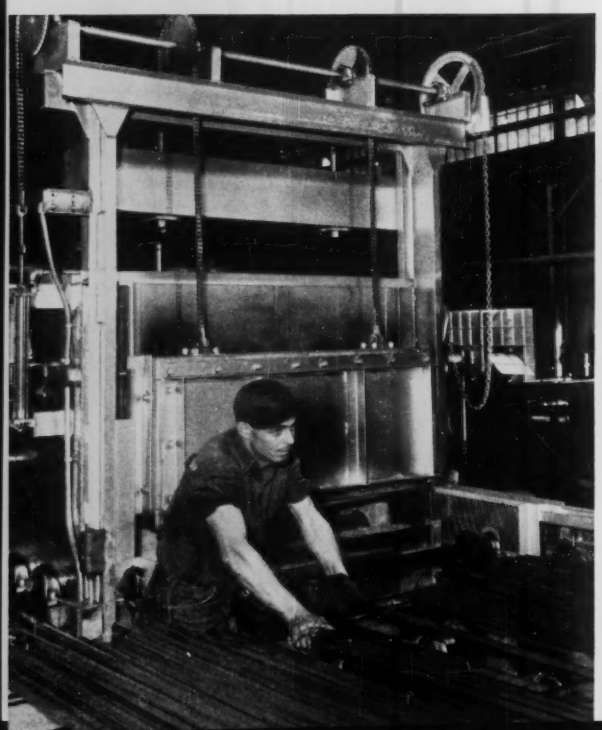
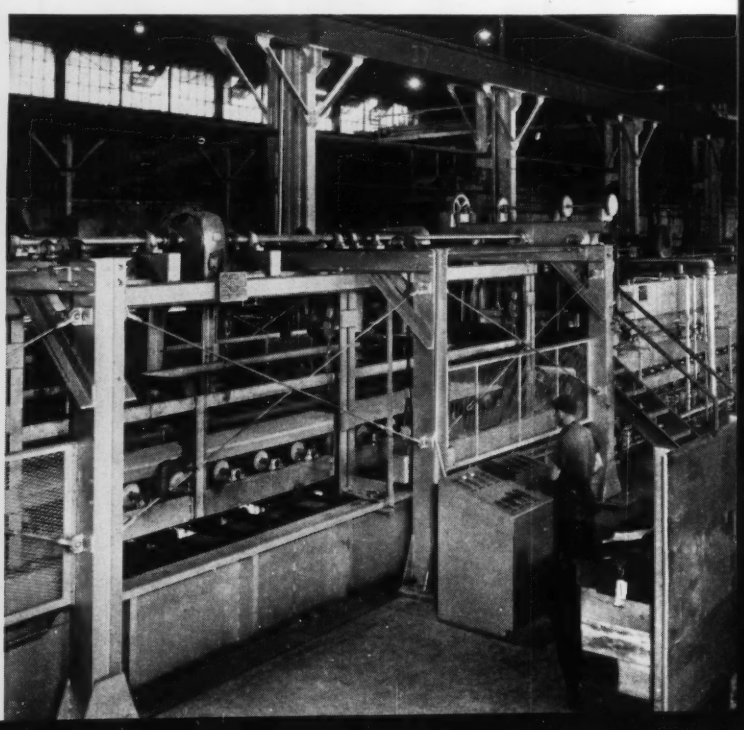
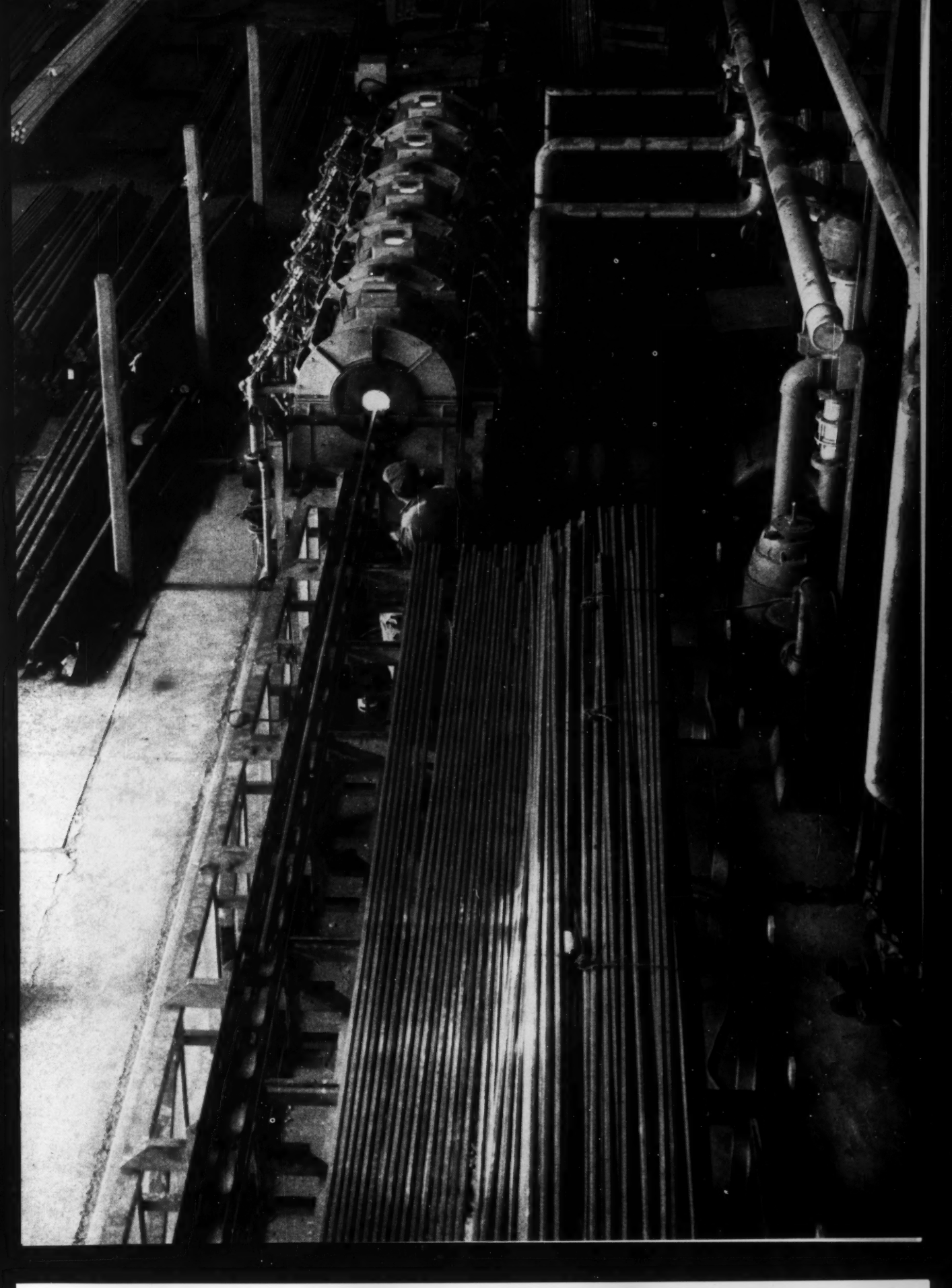
FORMERLY ROTARY ELECTRIC STEEL CO.







(Advertisement)

TIPS ON TRUCKS

Electric trucks give clean, quiet, safe operation

In critical warehousing operations, certainly, the arguments in favor of "going electric" are numerous. Even if you consider just a few—say cleanliness, quiet operation, and safety, the balance is way in favor of the battery-operated truck.

Clean? No worry about fumes, objectionable odors, oil drip, when you run electrics.

Quiet? You can hardly hear electrics glide by. Here's smooth, silent power . . . no noise problems for workers.

Safety? Consider the absence of carbon monoxide, minimum fire and explosion hazards.

Makes quite a case for electrics!

Look to the power source ... the extra-capacity battery

Just as there is a big difference between types of trucks, so is there a big difference between batteries.

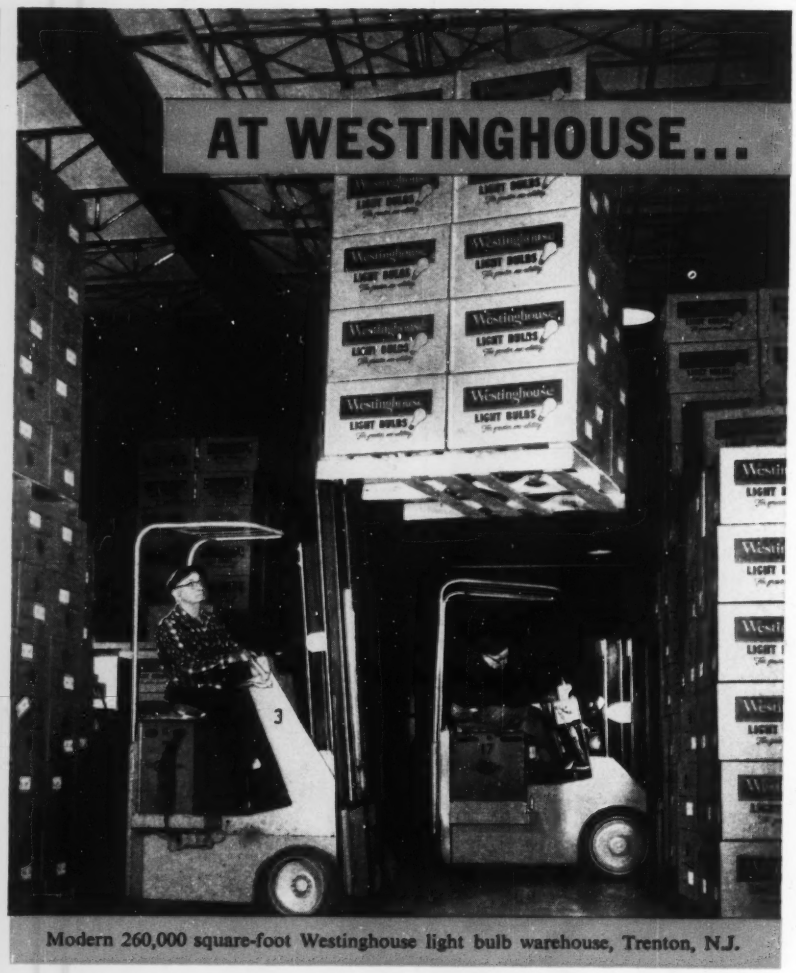
Wherever electric trucks are powered by modern, advanced-design C & D *Slyver-Clad* batteries, companies are able to get the most out of their trucks. Here is the best power package available today. Plates are longer, heavier, designed so as to eliminate "shedding"—thus prolonging battery life. In addition, all C & D *Slyver-Clad* batteries are now equipped with new Hi-Impac cell covers and containers. Truck downtime due to cell cover or container breakage is virtually eliminated.

(It will pay you to check on electric trucks powered by C & D batteries. Just send for the literature offered in advertisement at right.)

Match best with best

...the best in trucks—*electric*

...with the best in batteries—C & D



Modern 260,000 square-foot Westinghouse light bulb warehouse, Trenton, N.J.

Move a million bulbs a day; electric trucks silent, safe, sure

Trucks all electric ... powered by C & D

"You can be *sure* . . . if it's Westinghouse." And you can be sure Westinghouse is geared for peak-efficiency operation in its modern Trenton, N.J., Lamp Division Shipping Centre—largest warehouse in the country for the storage of electric light bulbs.

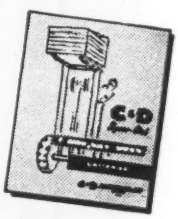
Moving *in* and moving *out* a *million* light bulbs a day at this strategic distribution center calls for a large fleet of forklift trucks. Trucks are efficient, clean, quiet. They're all *battery-electric* . . . have been for the past 10 years. And powered by C & D *Slyver-Clad*® batteries, the trucks not only run a full shift without recharging—they often work 10 to 11 hours at a stretch—thanks to C & D's extra capacity.

Westinghouse, too, uses C & D!

It pays to see why "C & D is a better battery buy"

See how C & D's advanced principles of design and extra battery capacity cut material handling costs . . . give your trucks a power boost.

Write for descriptive bulletins.



C&D

BATTERIES, INC.

of Conshohocken, Pa.

SINCE 1906

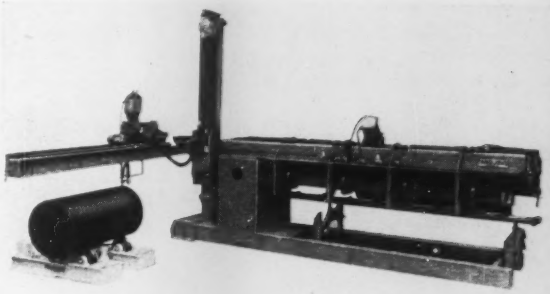
Sales and service offices in principal cities from coast to coast

Automatic Equipment Welds Cylinders and Tanks

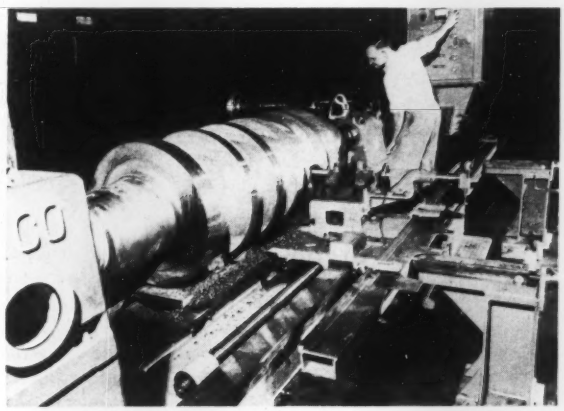
This seamer can weld tanks measuring 12 to 36 in. ID and up to 12 ft long. Pretacking is eliminated by an air operated, gap closing mechanism. The roller conveyor system aids in handling.

The automatic welding head is mounted on a self-propelled travel carriage so that longitudinal seams are welded while the cylinder is clamped in a fixture.

Circumferential welds are made by rotating the manipulating fixture over the cylinders mounted on variable speed turning rolls. *Write*: Pandjiris Weldment Co., 5151 Northrup Ave., St. Louis 10, Mo. *Phone*: Prospect 6-6893



Contour Roll Lathe Is Controlled Electronically



The electronic follower control mechanism of the lathe is so sensitive that it can duplicate the contours of a master template within 0.001 in.

The lathe has a 60-in. swing and is 25 ft between centers. It is used for dressing backup rolls and turning structural rolls. It can turn rolls weighing up to 75 tons. Speed range: 0.17 to 62 rpm.

A number of special features speed setups and changeovers. The lathe has a power-traversed tailstock and power-traversed neck housings with hydraulic locking clamps.

Structural shape rolls can be turned because the lathe can cut passes automatically at high speed. *Write*: Mackintosh-Hemphill Div., E. W. Bliss Co., 901 Bingham St., Pittsburgh 3, Pa. *Phone*: Hemlock 1-3000

Torch Has Separate Preheating and Scarfing Oxygen Lines

This three-hose scarfing torch has two oxygen flows—all the way back to independent pressure regulators.

Model 33 eliminates sudden changes in preheat flow when the main scarfing stream is started or stopped suddenly.

The removable guard over the head of the torch and the skid ring on the end of the tip are made of wear-resistant alloys.

The tool's balance is engineered for scarfing work. The scarfing lever, preheat oxygen adjustment, and acetylene valve are placed conveniently.

Capacity of the torch is 6000 cu ft an hour of scarfing oxygen at a station regulator outlet pressure of 100 psi when used with 50 ft of ½-in. hose.

Tip sizes for different classes of work are ½, ⅝, and ¾ in. (scarfing port diameter). *Write*: National Cylinder Gas Co., 840 N. Michigan Ave., Chicago 11, Ill. *Phone*: Whitehall 4-3100

NEW PRODUCTS and equipment

Portable Filter

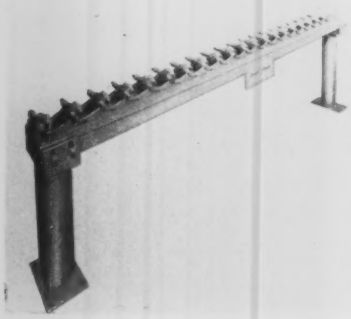
This machine does intermittent or constant filtering and transfer pumping. It can handle up to 900 gallons an hour.

The solution enters at the bottom of the unit and is discharged at the top. This prevents the liquid from bypassing the filter.

A centrifugal pump is enclosed within the filter, eliminating need for a separate pump casing. *Write*: Hanson-Van Winkle-Munning Co., Matawan, N. J. *Phone*: Matawan 1-1000

Storage Track

This conveyer prevents parts from touching each other as they move by gravity.



Collisions are prevented. The weight of one part entering a counterbalanced flipper depresses the downstream end and raises the upstream end, stopping the second part. When the first part leaves the downstream end, all following parts advance one station. *Write*: Cargill Detroit Corp., Birmingham, Mich. *Phone*: Midwest 4-5400

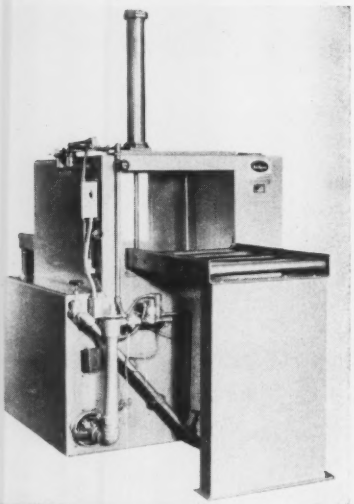
Washing Machine

The Clean-Line washer uses hot caustic or detergent to remove oil from work before and after heat treating. It can also be used for general cleaning.

Two models are available. One is loaded at the front and unloaded at the back. The other is loaded and unloaded through the same opening.

The hooded solution tank holds 300 gallons and is equipped with an overflow trough and a drain valve.

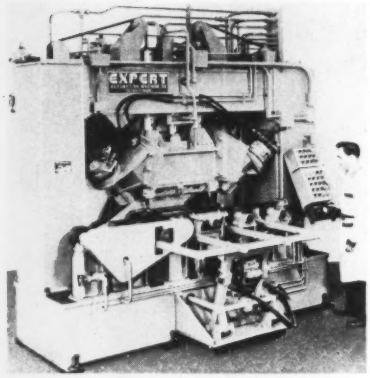
A pneumatically operated rack lowers work into the tank. A timer is used to control the cycle.



The solution is heated by an atmospheric immersion burner firing into a 5-in. heating tube. The gas-fired burner has an input of 175,000 Btu an hour. *Write*: Eclipse Fuel Engineering Co., Rockford, Ill. *Phone*: 8-3751

Forming Machine

Four bends in hot steel bars are made by this transfer machine. All bending and contour forming operations on the rectangular steel



bars are performed at one working station.

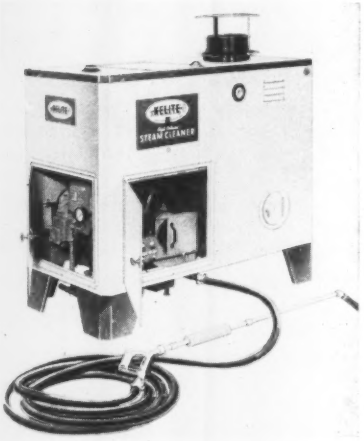
Parts to be formed are fed automatically from a furnace to the transfer mechanism of the machine. Production rate: 500 auto bumper support arms an hour.

In the working station, an overhead ram performs one bending operation while a hydraulically operated die set does the three remaining bending operations. The machine can be adapted to a variety of parts by changing the die set. *Write*: Expert Automation Machine Co., 17144 Mt. Elliott Ave., Detroit 12, Mich. *Phone*: Twinbrook 1-4327

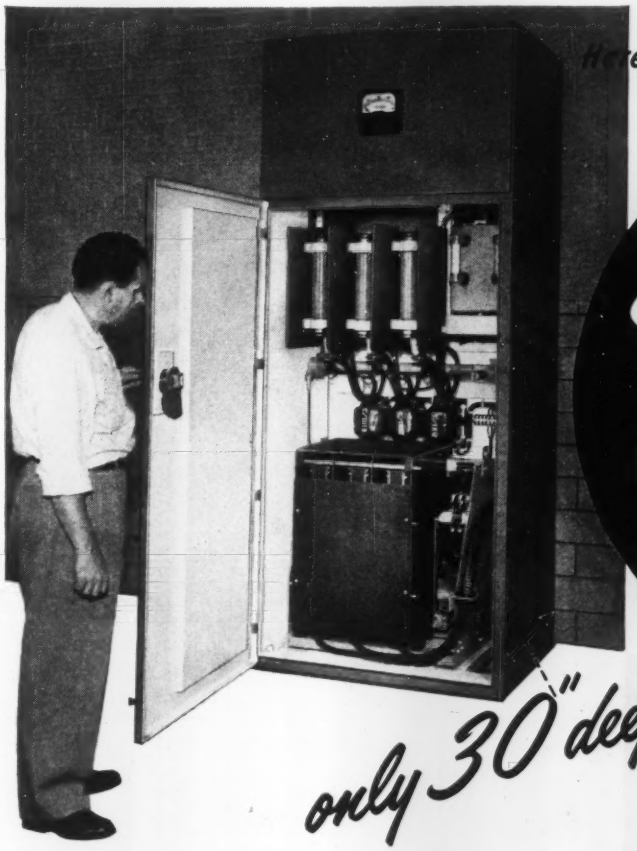
Steam Cleaners

This line of three steam cleaners is rated at 320° F. Mark I, for light to medium duty, has an output of 120 gallons an hour; Mark II, for medium to heavy duty, 200; Mark III, for maximum duty, 300.

Each of the cleaners has a positive displacement piston pump capable of delivering its full rated output hundreds of feet from the

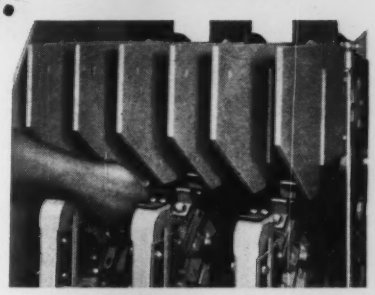


Here is **DESIGN LEADERSHIP...** *in Action!*



Save Space with New EC&M High Voltage (2200-4800 VOLTS) Starters

only 30" deep!



NO DRAW-OUT NEEDED • Arc shields slide out horizontally, making front and rear contact-tips removable with standard wrench.

Accessible from Front...

(Solid back) • Starters may be mounted against wall or in double row, back to back

Safe...

Starter DISCONNECTED from bus as door is opened
Low voltage section isolated from high voltage

Interlocked...

against accidental closure by simple rod mechanism
Large wiring space for incoming leads

EC&M's new ZHA Starter not only saves valuable floor space—it provides more accessibility and convenience than ever before. Starters are available with self-contained bus in isolated compartment. A gang of starters requires only one incoming feeder. Additional starters can be added as needed—with no sacrifice in neat, streamlined appearance. All starters are self-contained and complete with control transformer supplying low voltage for pushbutton circuits.

***Write for* BULLETIN 8130-F**

3 Interrupting Ratings for Squirrel Cage, Synchronous and Wound-rotor Motors

1. **CLASS E 1** • 50,000 KVA (symmetrical) based on certified tests.
2. **CLASS E 2** • With current limiting fuses and high interrupting capacity contactor. At 2300 volts: 150,000 KVA, 3 phase; 60,000 RMS amperes asymmetrical. At 4,800 volts: 250,000 KVA, 3 phase; 60,000 RMS amperes asymmetrical.
3. **VALIMITOR®** • May be used on a bus of unlimited short circuit capacity, through the use of a contactor with an interrupting rating of 50,000 KVA, and reactors which limit any fault current to a maximum of 25,000 KVA.

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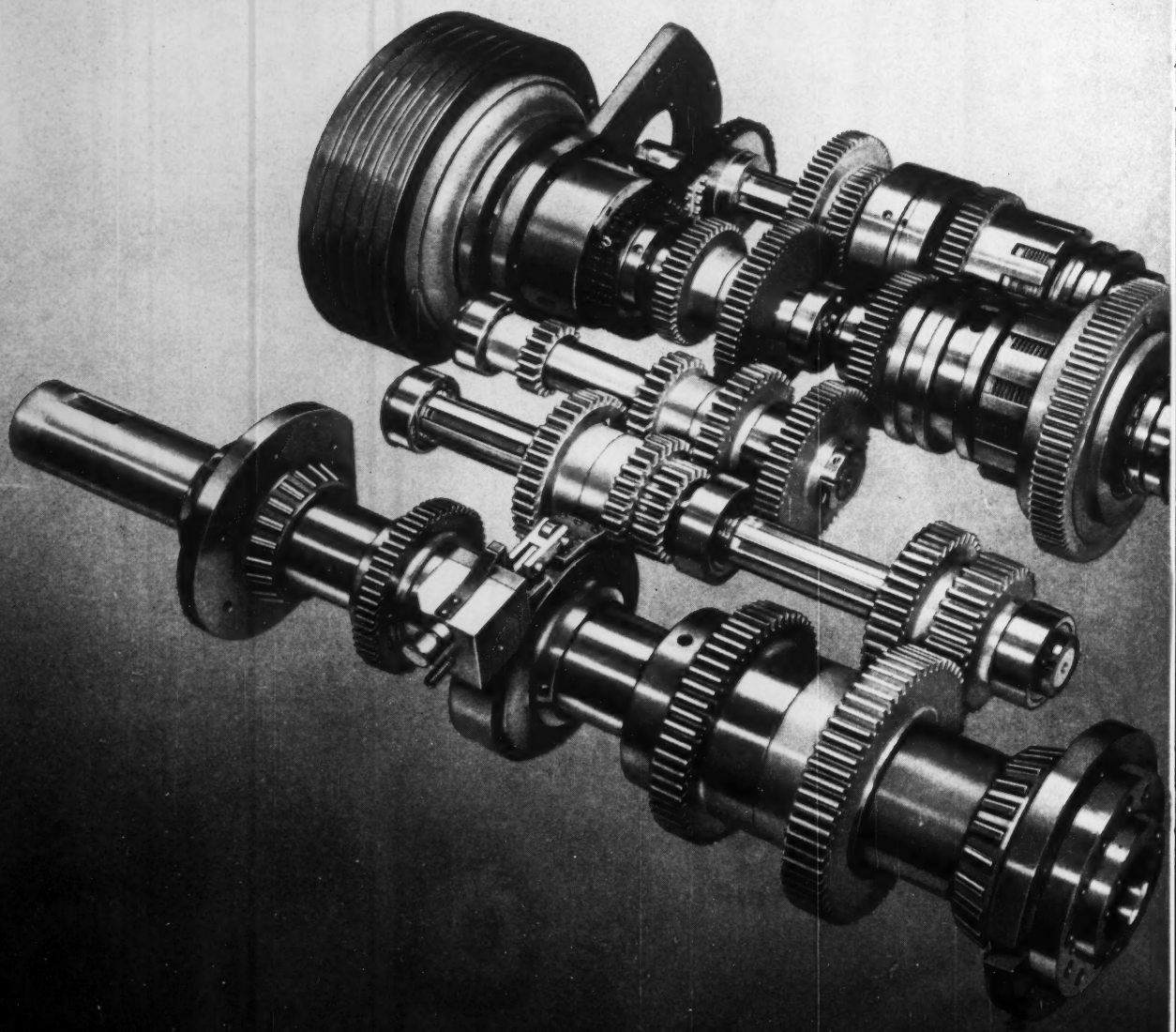
The **power reserve** *and* **range of speeds**

YOU'LL NEED FOR THE



TOOLS OF TOMORROW

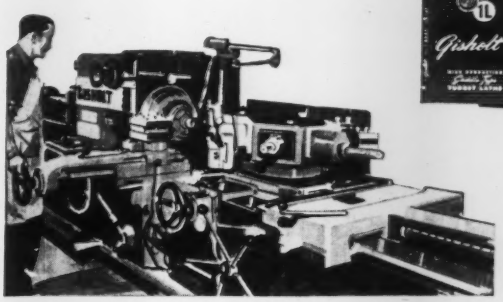
New GISHOLT MASTERLINE SADDLE TYPE TURRET LATHE

WANT MAXIMUM OUTPUT AND ACCURACY from today's carbide tools—with an ample reserve of power and speeds to meet tomorrow's tooling requirements?

That's what you'll get—*now*—from this powerful, rugged Gisholt MASTERLINE Saddle Type Turret Lathe. Prime example of this machine's advanced features is the rugged Headstock Gear Train, shown at the left. Here, you can get 24 different forward speeds—all from a *single*-speed motor. This means you get *full* power *all* the time—a critically important feature for those heavy cuts at punishing feeds.

But that's not all. To give you maximum performance from this powerful gear train, Gisholt designers have backed it with faster speed changes through the Hydraulic Speed Selector (effortless speed shifts without waiting or computing); a hydraulically operated Hi-Lo speed change in a 6:1 ratio (without stopping the spindle or shifting gears); and a new Self-Adjusting Electric Clutch and Brake (smooth, fast starting and stopping, plus more accurate inching of the spindle).

Ask your Gisholt Representative to give you the complete facts. Why not call him today?



ASK FOR complete set of Gisholt MASTERLINE Saddle Type Turret Lathe Bulletins.

GISHOLT MACHINE COMPANY

MASTERLINE GISHOLT SINCE 1887

Madison 10, Wisconsin, U.S.A.

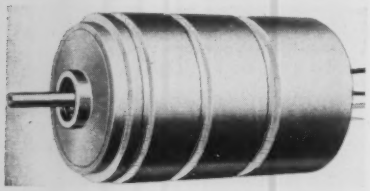
TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • PACKAGING MACHINES • MOLDED FIBERGLAS PLASTICS

machine. A water-wall heat exchanger is used.

The steam cleaning gun has a swivel-type rear grip and a forward grip aerated to provide cool operation. *Write*: Kelite Corp., 81 Industrial Rd., Berkeley Heights, N. J. *Phone*: Crestview 3-5500

Stepping Motor

The Syncramental is a precision bidirectional stepping motor which translates pulses to incremental shaft positions. Uses include rotation of potentiometers, counters, rotary switches, and control mechanisms.



A special magnetic clutch indexes the shaft. Angular increment per pulse is 36 degrees in either direction at a maximum stepping rate of 15 a second.

Life expectancy is 2 million steps in either direction. *Write*: G. H. Leland Inc., 123 Webster St., Dayton 2, Ohio. *Phone*: Michigan 9891

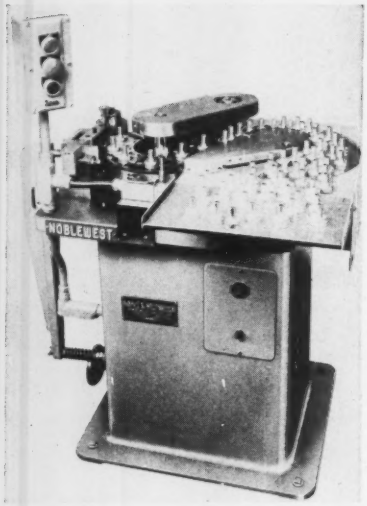
Marking Machine

The Dual-Dial marks thin wall cup-shaped parts or tubes at production rates over 5000 pieces an hour.

A 1/3-hp motor mounted in the column of the machine drives two counter rotating dials. The work feed dial rotates counterclockwise and carries the workpieces to a reciprocating feed finger. The finger transfers each part onto a work mandrel or a 12-station dial which rotates in a clockwise direction.

The parts are carried through a spring loaded compensating die holder head where the mark is applied. Parts rotate on the work mandrels as they travel across the face of the marking die.

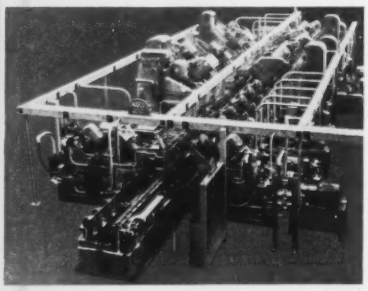
Parts are ejected automatically



at the rear of the machine. *Write*: Noble & Westbrook Mfg. Co., East Hartford, Conn. *Phone*: Butler 9-2717

Transfer Machine

The Holeway processes 120 cylinder blocks an hour through its 21 stations. All of the drilling and milling operations are completed on the faces presented.



Parts can be removed by dropping the guide rail at stations which operate on one side. *Write*: National Automatic Tool Co. Inc., Richmond, Ind. *Phone*: 2-1183

Steel Electrode

Super-SteelTectic 110 welds mild steels and high strength, low alloyed steels.

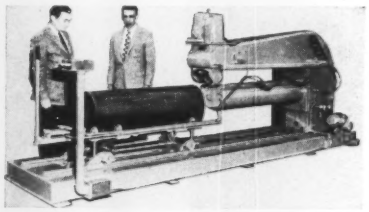
At low amperages, the electrode with shallow penetration can be used on thin-walled tubing, sheet metal, and poor-fitting joints. In the upper range, it is effective on structural steel welding of heavy plate, framework, angle, and beams.

The electrode can be used for alternating or direct current welding. Its coating offers some control over arc drive, penetration, and deposit buildup. *Write*: Technical Information Service, Eutectic Welding Alloys Corp., 40-40 172nd St., Flushing 58, N. Y. *Phone*: Flushing 8-4000

Weld Roll Planisher

Flash, resistance, and fusion welds are cold rolled and flattened under controlled pressures up to 10 tons by this machine.

Model 47560 will receive, planish, and eject a shell 52 in. long in 18 seconds. The automatic carriage

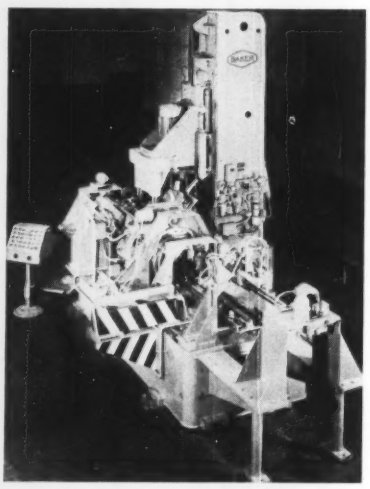


is readily adjustable to various diameters. *Write*: Airline Welding & Engineering Co., 785 N. Prairie Ave., Hawthorne, Calif. *Phone*: Oregon 8-5112

Inspects Blocks

This special machine determines the wall thickness of V-8 cylinder blocks. It automatically checks the walls to determine if any are too thin as a result of cores shifting during molding.

If the minimum wall thickness cannot be maintained, the block is



FOR THE FIRST TIME!...

ADJUSTABLE ALUMINUM

ARMY TYPE

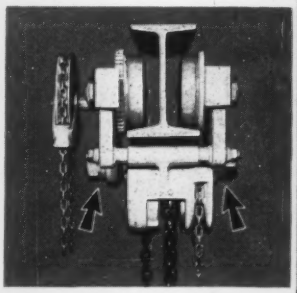
TROLLEY HOISTS

. . . ¼ THRU 10 TON CAPACITY RANGE

CAPACITIES
Push Models: ¼ to 10 Tons
Hand Geared Models: 1 to 10 Tons

New 'Budgit' Aluminum Army Type Trolley Hoists — another "first" from "Shaw-Box" — are designed to save you time, trouble and money. The complete line includes 8 hand geared and 10 push models. On every capacity . . .

It's Easy to Adjust the Trolley to Fit the I-Beam!



You can work a 'Budgit' Aluminum Army Type Trolley Hoist from an I-beam of one size today and switch to another size I-beam any time — easily. Just relocate the spacer washers on the trolley cross shafts during installation. That's all there is to it. The more washers "sandwiched" between trolley side plates and hoisting unit, the bigger the I-beam the trolley will fit. Depending on hoist capacity, adjustment can be made for I-beam sizes ranging from 4" to 24".

The trolley side plates are non-fracturing rolled steel with end bumpers that serve as safety lugs on all but the smallest models. Long-life sealed ball bearing in all wheels assure smooth travel. Wheel treads on the larger capacity models are flame-hardened for longer wear. On hand geared models, the wheel and guide are weatherproof aluminum alloy. All hand chains are cadmium plated to resist rust and corrosion.

'Budgit' Aluminum Army Type Trolley Hoists have high hook lift and exceptional low headroom advantages. The heavy-section aluminum alloy hoist frame and covers save weight yet have great shock resistance. "Equa-torque" spur gearing distributes the load evenly on two sides of each gear; anti-friction bearings also contribute to high efficiency. Practically all muscle effort is converted to useful work. 500 lbs. can be lifted with a hand chain pull of only 25 lbs.

For extra safety, the load chain, gears and shafts are tough heat-treated alloy steel; the forged steel load hook opens slowly on extreme overloads. No pressed fits, no keys or keyways to wear or shear — spline connections are used throughout. All parts operate in sealed housings. Maintenance is easy.

EXCEPTIONAL LOW HEADROOM DUE TO MODERN DESIGN

GET ALL THE FACTS

Light, adaptable 'Budgit' Aluminum Army Type Trolley Hoists are built rugged for years of money-saving service. Spark and corrosion resistant models available. *Call your "Shaw-Box" Distributor for details or write us for Bulletin 15010-10-57.*

57C – 12C

MAXWELL MANNING M&M MOORE INC. TRADE MARK

'Budgit'® CHAIN BLOCKS

MANNING, MAXWELL & MOORE, INC.

384 West Broadway • Muskegon, Michigan

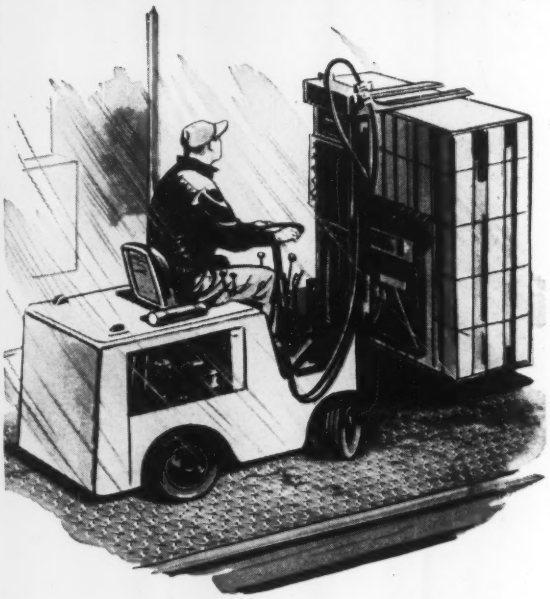
Builders of "Shaw-Box" and 'Load Lifter' Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Other Divisions produce 'Ashcroft' Gauges, 'Hancock' Valves, 'Consolidated' Safety and Relief Valves, 'American' and 'American-Microsen' Industrial Instruments, and Aircraft Products.

In Canada: *Manning, Maxwell & Moore of Canada, Ltd., Avenue Road, Galt, Ontario.*

LOW COST DIFFERENCE BETWEEN

SKID

NO SKID



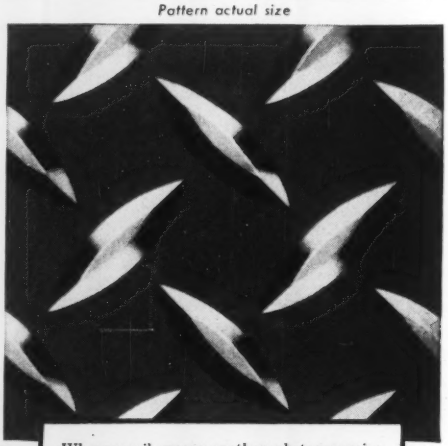
A.W. Super-Diamond rolled steel floor plate

- raised steel figures *diamond-shaped for maximum slip-skid resistance from all approach angles.*
- tough rolled steel floor plate for maximum industrial wear.
- non-directional pattern—no matching problems—minimum waste.
- easily fabricated with ordinary shop equipment for rapid installation.
- no maintenance problems—cleans, drains rapidly.
- use as independent flooring, structurally or as overlay.

For complete information write on company letterhead to Dept. SD-S12.

No other floor plate can match A.W. Super-Diamond's safety and durability at so low a cost.

Pattern actual size



Wherever oil, grease, or other substances raise special slipping accident hazards, we suggest a check on the special non-slip qualities of A.W. ALGRIP—the world's only abrasive rolled steel floor plate.

A.W. SUPER-DIAMOND

ROLLED STEEL FLOOR PLATE

ALAN WOOD STEEL COMPANY • CONSHOHOCKEN, PA.

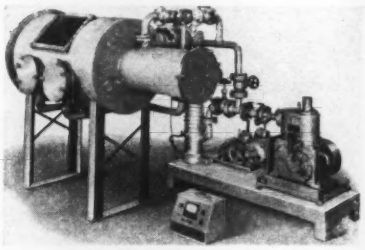
Other Products: A.W. ALGRIP Abrasive Rolled Steel Floor Plate—Plates—Hot and Cold Rolled Sheet and Strip—(Alloy and Special Grades)

rejected automatically. Small core shifts which leave the wall thicknesses within range are compensated for by averaging the shifts.

Two holes are drilled and reamed in the block before it is turned over for subsequent operations. *Write*: Baker Brothers Inc., Toledo 10, Ohio. *Phone*: Cherry 4-9511

Vacuum Chamber

Model VC-32 is a vacuum unit with a capacity of 32 cu ft. It can achieve a vacuum of better than 10^{-5} mm of mercury.

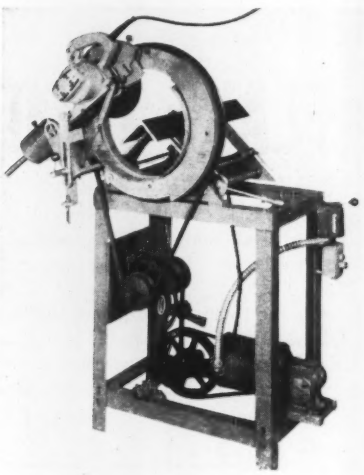


There are glove and view ports on each side. The chamber can be used for welding, casting, and metallurgical research. *Write*: L & B Welding Equipment Inc., 2424 Sixth St., Berkeley 2, Calif. *Phone*: Thornwell 3-5720

Cutting Machine

The Roll-A-Round cut machining unit is built in two standard sizes.

One will cut pipe and tubing with an outside diameter of 6 5/8 in. and channels, angles, I-beams, and other shapes that will fit into a 6-in. circle. The other cuts parts that will fit into a 12-in. circle.



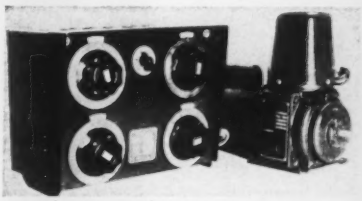
These dry abrasive cutting units have a variable drive system which permits the proper selection of the rotation speed of the cutting head around the work. *Write*: Wallace Supplies Mfg. Co., 1304 Diversey Parkway, Chicago 14, Ill. *Phone*: Buckingham 1-7000

Program Control

The Sequentrol establishes a number of functions that must take place in a predetermined order to preset values. Uses include machine tool and welding positioner programming, work station control for assembling machines, and dipping machine programming.

The unit can be used to control a number of different machines in sequence or to provide a program control of several steps for one machine.

A vernier dial or revolution counter type control is set on the unit's panel for each position or rate. Each dial or counter governs the setting of a shaft-mounted gear motor which, in turn, establishes the position of a tool, the setting of a variable speed drive or valve, or the location of an assembly table or indexing device.



Reset accuracies are within 0.2 per cent. *Write*: Jordan Co. Inc., 3235 W. Hampton Ave., Milwaukee 9, Wis. *Phone*: Uptown 1-3200

Chemical Stripper

Iso-Strip is an organic compound which, when combined with sodium cyanide and dissolved in water, strips plated deposits from ferrous-base metals without the use of electrical current. The buffing and polishing normally required when salvaging plating rejects are eliminated.

Copper, nickel, cadmium, zinc, and silver can be removed without

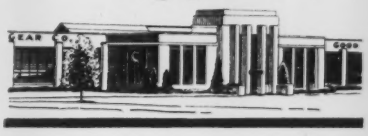
. . . PUT UP THE WIND SHIELD, NELLIE

When the going got dusty back in 1907, Nellie had to put up the "wind shield" on this early Pope-Toledo. Mamma was too busy with spark, throttle, mixture, lubricator, cone clutch, progressive shift, bulb horn, two-hand steering and hand-and-foot brakes to do that too. And can you imagine what that gritty, billowing dust did to the EXPOSED *gears*, protected only by some sticky, poor-grade grease? No wonder tolerances were generous — and gear life short!

Into this pioneering atmosphere plunged John Christensen and Soren Sorensen, to start in the gear business. The problems that faced them then were different than those we face today, but we still adhere religiously to their formula for meeting them — do the best job possible every time, and be sure it's done a little better than anyone did it before. We think that's the main reason we've built up such a satisfied list of steady customers over the past 50 years. We'd like to add *you* to this list too — why not give us an opportunity on your next custom gear order?

THE CINCINNATI GEAR CO.
CINCINNATI 27, OHIO
Fifty Years of "Gears — Good Gears Only"

CINTI®



CHICAGO CARDINALS FAIL TO FLAKE TI-CO®

Hard to believe. But not a chip, not a flake in TI-CO's coating—even at edges of deepest dents.

First-string linesmen Stonesifer, Dahms, Dittrich, Simmons, Hogland, Jennings and Nagler—nearly a ton of hard-hitting pro footballers—gave it everything they had, and still couldn't flake TI-CO.

Dent it? Sure. They dented quite a few opponents during the past season, too. But not a crack, chip, or trace of peeling or flaking could be found on this sheet of TI-CO, even after shoe cleats, backed with all that muscle, pounded it unmercifully.

Most TI-CO users don't wear cleats, but even the toughest, roughest handling or fabrication won't flake TI-CO's protective zinc coating. And that means absolutely dependable corrosion resistance.

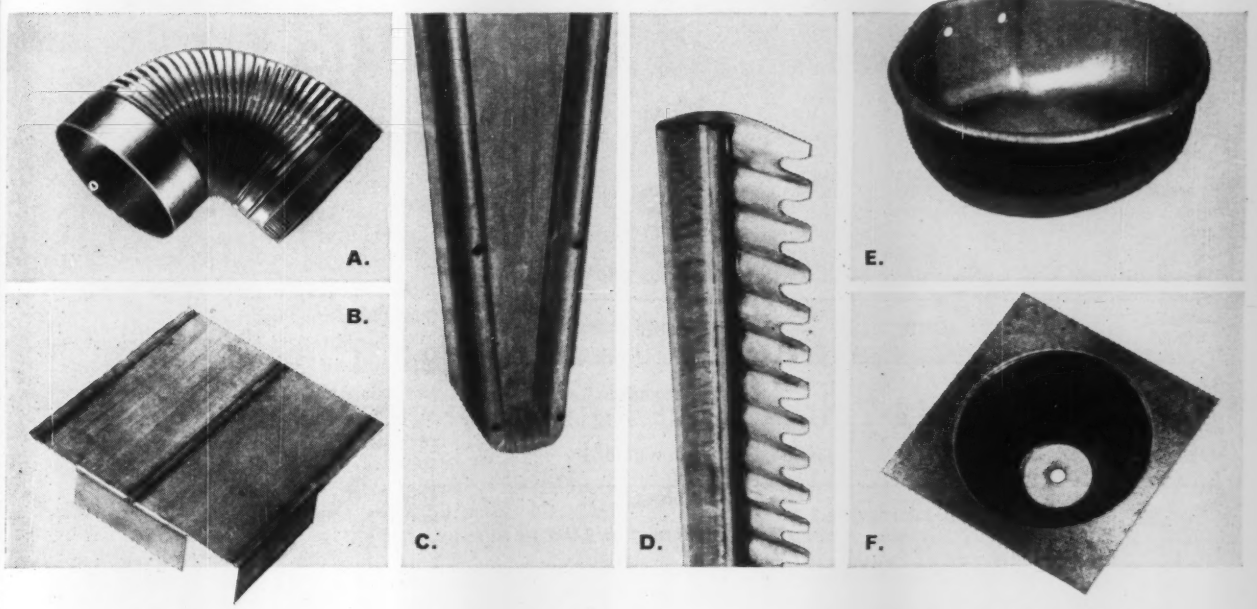
No forming operations too tough for Inland TI-CO galvanized sheets

If your products require deep-drawing, roll-forming, Pittsburgh lock-seaming, spin-drawing, crimping, perforating, or any other difficult fabricating process, you can make them with TI-CO and have the added advantage of over-all corrosion resistance. If you're presently using conventional pot galvanized, you can save money by switching to TI-CO. That's because TI-CO galvanized sheets, made by the patented Sendzimir process, take the most severe forming in stride, without flaking or peeling of the zinc coating. Rust doesn't have a chance to get a foothold. Unlike products made from conventional pot galvanized steel sheets, those made with TI-CO do not require re-dipping or "touch-ups" after fabricating, and rejects are greatly reduced. And TI-CO costs no more.

Non-flaking Inland TI-CO galvanized sheets are making possible many new products and helping to reduce production costs on old ones. It will pay you to investigate the possibilities for TI-CO in your operation.

TI-CO GALVANIZED SHEETS ARE NOW READILY AVAILABLE!

The terrific demand for this high quality sheet has kept TI-CO in short supply since its development. Now, additional production facilities have been completed making greater quantities available.



A. Crimping on ductwork elbow. **B.** Pittsburgh lock-seams hammered tight. **C.** Roll-forming and crimping. **D.** Stamping and brake forming. **E.** Deep drawing and punching. **F.** Spin drawing. No matter how severe the operation, TI-CO galvanized sheets take it . . . and the zinc coating stays put!

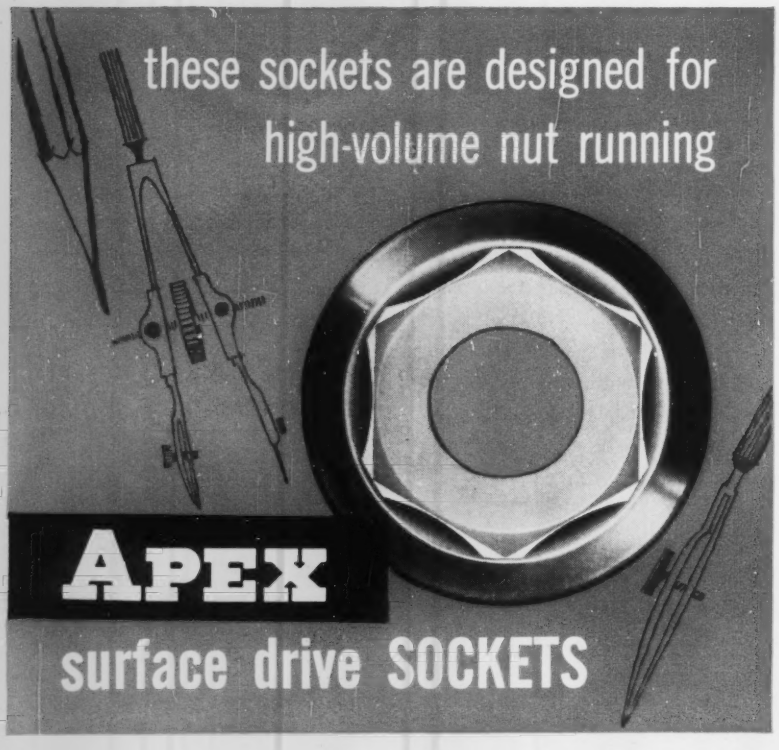
TI-CO is available in cut sheets or coils, in gages 8 to 30 inclusive and widths as great as 60 inches. TI-CO comes with dry, oiled or chemically treated surfaces. Consult your local steel distributor or your Inland representative for your requirements.

INLAND STEEL COMPANY

38 South Dearborn Street • Chicago 3, Illinois
Sales Offices: Chicago • Milwaukee • St. Paul • Davenport
St. Louis • Kansas City • Indianapolis • Detroit • New York

INLAND TI-CO®

Look for this brand—
your assurance of
non-flaking performance



The large opening at each corner of the hex is the reason why an Apex surface drive socket gets right on the nut, bolt or cap screw. The hex broached opening of the socket matches up perfectly with the hex head of the fastener almost instantly upon contact.

That's why Apex surface drive sockets will help you increase productive output on any high-volume nut running job. You'll keep costs down, too, because the socket drives against the center of the hex flats of the fastener, preventing damage.

you can get APEX surface drive SOCKETS in these types and sizes:

SQUARE DRIVE	LENGTHS	BROACHED OPENINGS
1/4"	Standard Long Extra Long	3/8" through 5/8"
9/32"	Standard Long Extra Long	3/8" through 5/8"
3/8"	Short Standard (thin or standard wall) Long Extra Long	3/8" through 7/8" 3/8" through 1-1/16"
1/2"	Standard (thin or standard wall) Long Extra Long (thin or standard wall)	3/8" through 1-1/16"
5/8"	Standard Extra Long (thin or standard wall)	7/16" through 1-1/16"
3/4"	Standard Extra Long (thin or standard wall)	1/2" through 1-1/16"

Catalog 129—Write, on your company letterhead please, for your copy.

APEX THE APEX MACHINE & TOOL COMPANY
1032 S. Patterson Blvd. • Dayton 2, Ohio

ATLANTA • BALTIMORE • BATON ROUGE • BIRMINGHAM • BUFFALO • CHARLESTON
CHICAGO • CLEVELAND • COLUMBUS (Newark) • DALLAS • DAVENPORT • DENVER
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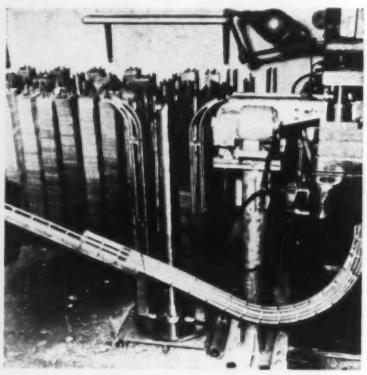
PHILADELPHIA • PITTSBURGH • PROVIDENCE • ROCKFORD • ST. LOUIS • SEATTLE
SHREVEPORT • SOUTH BEND • SYRACUSE • WICHITA

etching the base metal. Racking is eliminated; the parts can be stripped in baskets or tumbled in barrels. *Write*: Wagner Bros. Inc., 400 Midland Ave., Detroit, Mich. *Phone*: Tulsa 3-0100

Stacking Chutes

Stampings that are springy, small, thin, delicate, or complicated are transported automatically from the presses to packaging or assembly lines by this stacking chute. It can carry and stack stampings up to 20 ft from the press.



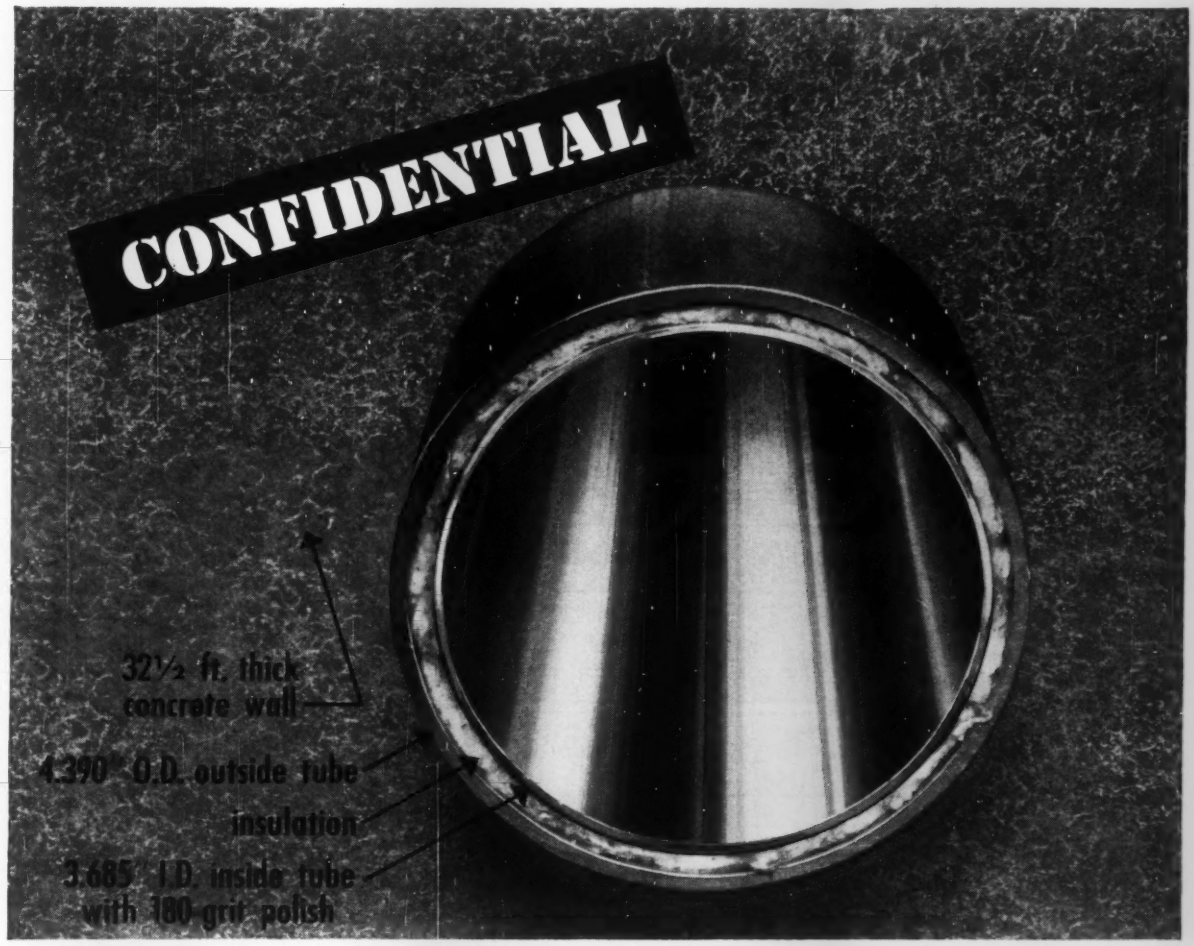
A one-way trap keeps parts from backing up.

The chutes are mounted on the die shoe of the press bolster and are adaptable to open back inclinable presses, high production presses, and dieing machines. *Write*: Clark Industries Inc., Delaware, Ohio. *Phone*: Delaware 2-4652

Power Positioning

This induction motor provides continuously adjustable power positioning without feedback reference. The motor operates from an alternating current, variable voltage power supply so that positioning in any portion of a revolution is in relation to a voltage ratio.

The motor has a squirrel-cage rotor and can be coupled directly to rotating shafts operating at high speeds without damage. The motor will stop and hold at a fixed point in a revolution, and two or



Proof why it pays to design *Carpenter* Welded Stainless Tubing into tough spots with "skin-tight" limits

Unusually close dimensional tolerances were required by the AEC on nearly 500 ft. of Carpenter Stainless Tubing now being used in the development of nuclear power reactors. The tubing of two different diameters is installed as shown by the above illustration through a 32½ ft. thick concrete wall. Temperature inside the tubing during operation ranges between 1600°F and 2000°F.

The outside tubing was produced within these close limits: 4.390" O.D. (+.000/−.025) ×4.100" I.D. (+.040/−.000); the inside tubing tolerances were: 3.830" O.D. (+.000/−.030) × 3.685" I.D. (+.040/−.000).

Let us demonstrate for you this same ability to produce uniform high quality corrosion and heat-resistant tubing to the tightest specifications. Call in your nearby Carpenter Distributor or Representative for a discussion of your needs.

MEMBER

The Carpenter Steel Company
Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Carpenter

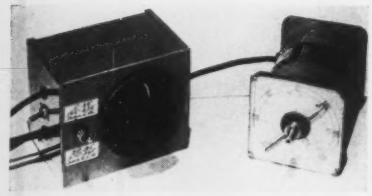
more than corrosion resistance

Stainless Tubing & Pipe

more units may be synchronized.

Models in the step motor line index in 60, 30, 15-degree, and smaller steps. It is based on the principle that when a squirrel-cage rotor having a special grouping of bars is placed in a single-phase field, the rotor will position itself in a definite relation to the magnetic field.

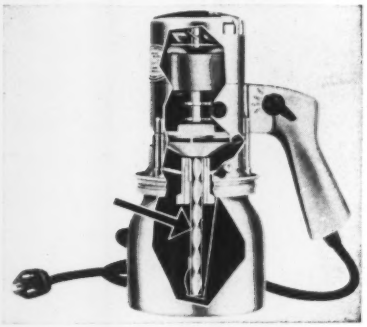
Rotor indexing is obtained by



energizing the stator winding in the desired sequence. *Write*: B. A. Wesche Electric Co., 1628 Vine St., Cincinnati 42, Ohio. *Phone*: Tweed 1-6600

Paint Gun Slings Paint

This centrifugal action gun avoids overspray and fogging. It has no valves or nozzles to clog. Instead, a nylon worm gear force-feeds paint of any viscosity or other material up through the hollow stem to the spinning rotors that sling the liquid out a gatelike opening in patterns ranging from ¼ to 12 in. wide.



The unit has the power of about a 1-hp compressor unit used with an air spray gun. The gun weighs slightly more than 3 lb. *Write*: Napco Inc., 3473 Fairmount Blvd., Cleveland 18, Ohio. *Phone*: Yellowstone 2-8930

Testing Machine

Electric motors are run in and checked by this conveyor type machine, the Lectrotest. It tests for grounds, open circuits, and shorts.

The unit can test about 1000 motors an hour when providing a 15-minute run-in period. Motors are tested at high speed, low speed, and at a stabilized power input.

Defective motors are shut off automatically.

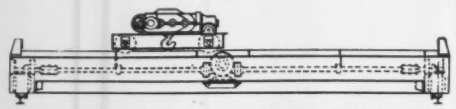
The machine can also be designed to check other electrical equipment, such as generators, distributors, coils, and regulators. *Write*: Michigan Production Engineering Co., Hazel Park, Mich. *Phone*: Lincoln 7-6444

Adhesive

Ray-Bond R-86001 bonds cured, natural or synthetic rubber to metal so tight that the rubber will tear before it can be peeled from the metal.

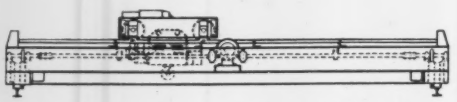
When cured at room tempera-

STANDARD HEADROOM
Provides highest hook height with top-running trolley and foot mounted hoisting unit.



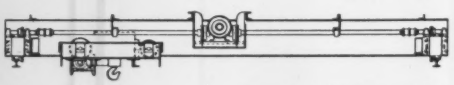
Model DTMD—TT

MEDIUM HEADROOM
Here the hoisting unit is rigidly suspended from the top-running trolley to reduce clearance over rail.



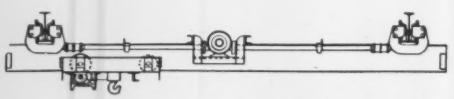
Model DTMD—LT

LOW HEADROOM
Under-running trolley permits unusually high hook lift. Use it where clearance under bridge must be maximum.



Model DTMD—UT

SUSPENDED TRACK
Operates on lower flange of crane runway suspended from roof guiders or other overhead support. Use also where load transfer is desired.



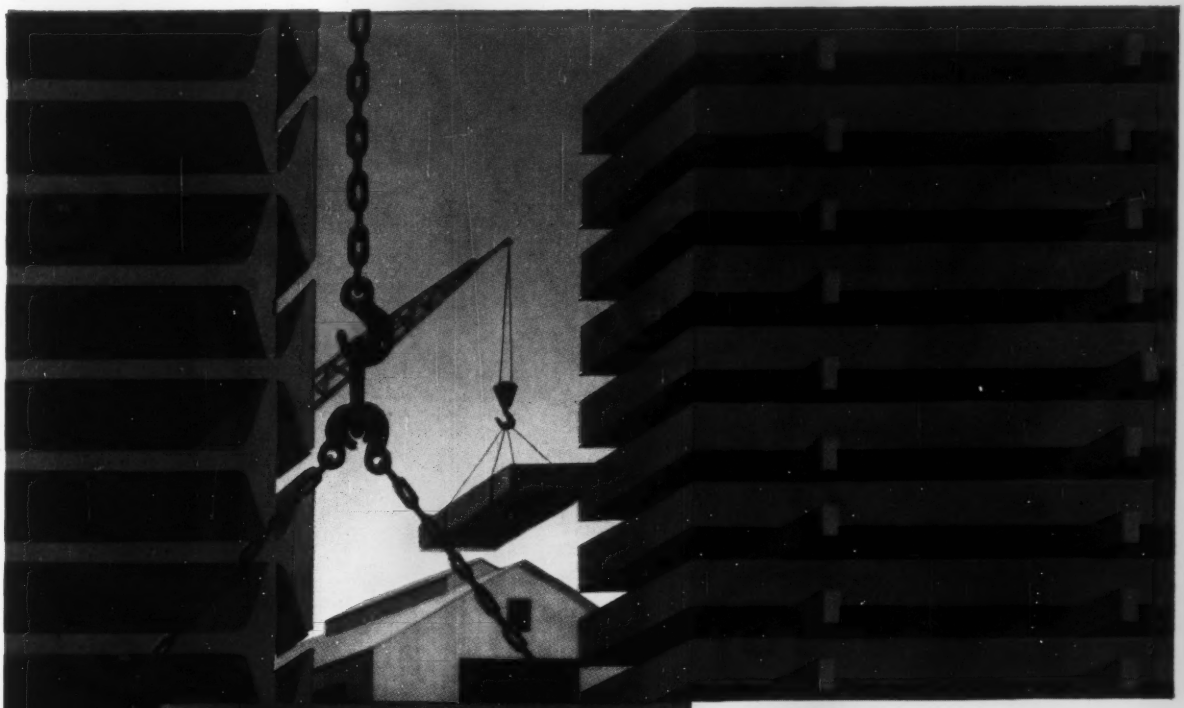
Model DUMD—UT

there is a
CRANEMASTER
for any building condition

Send For **BULLETIN C-110**

Describes in detail the many design and operating advantages of CRANEMASTER overhead traveling cranes. Also explains how Abell-Howe provides competent service from original survey to final installation.

ABELL-HOWE COMPANY 7747 Van Buren Street • Forest Park, Illinois



New Facilities to do a better job for you

During the past six months Levinson has been undergoing a major expansion program designed to meet the increasing demands of its customers for plain and fabricated steel.

New warehousing facilities have been acquired in McKees Rocks, Pa. and the company is in the process of adding new, modern equipment for cutting and fabricating. All of this adds up to an even better job for Levinson customers.

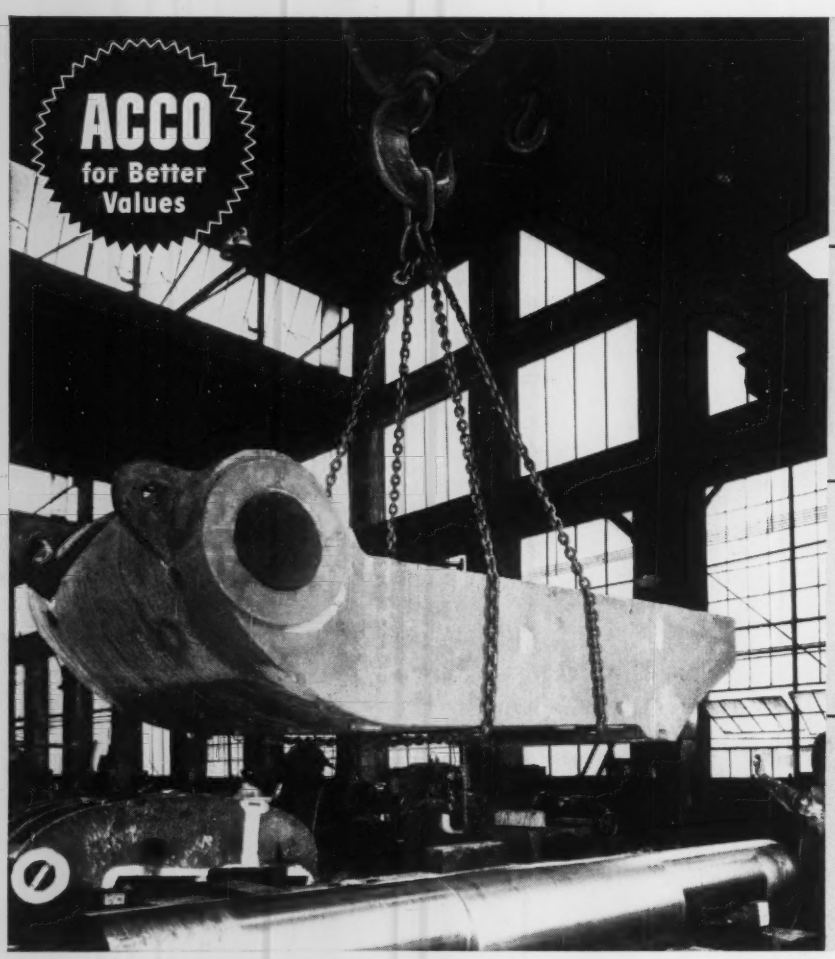
On your next order for plain or fabricated steel

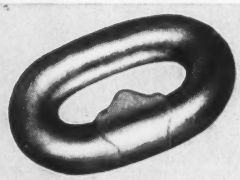
just . . . Leave it to **LEVINSON**

Warehousers, fabricators, designers of steel for over half a century

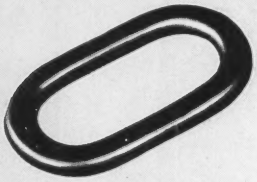
the **LEVINSON STEEL COMPANY**

Pittsburgh 3, Pa.
Phone: HUbbard 1-3200



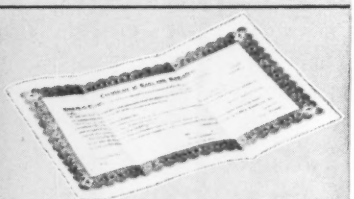


Accoloy X-weld 125 Chain
Pat. No. 2763768



New Shaped Master Link

ACCO Registration Ring



Registration Certificate

Big, costly loads are safe with Acco Registered® Sling Chains

• Pictured above is a huge, 35,000-pound casting being lifted *easily and safely* by a 4-leg ACCO *Registered* Sling Chain. Directly beneath the load is a highly polished and machined crank shaft worth many thousands of dollars.

Imagine the cost in lost labor and materials, should the sling chain fail! But it won't fail—for this ACCO *Registered* Sling Chain and all its components have the inbuilt strength needed to handle the job with complete safety!

When you buy an ACCO *Registered* Sling Chain, you get these four exclusive "plus values" which *add materially to the worth, but not to the cost,* of the sling:

1 • **Accoloy X-weld 125 Chain**, for extra strength. This chain hangs straight . . . does not kink . . . has extra resistance to bending.

2 • **New Shaped Master Link**, uniquely shaped to withstand deformation under loads up to 18% greater than a round-section link can do.

3 • **ACCO Registration Ring**, serially numbered as evidence that the assembled sling has been factory proof-tested to twice its working load limit.

4 • **Registration Certificate**, signed by us, attesting to the field-tested design and proof-testing of the complete sling.

Remember, the best sling is one of your most economical material-handling tools. You'll find it good business to consult your ACCO *Registered* Sling Chain Distributor on all your sling needs; his counsel is available without obligation. If you don't know his name, write us at York, Pa.

WHAT "ACCO REGISTERED" MEANS

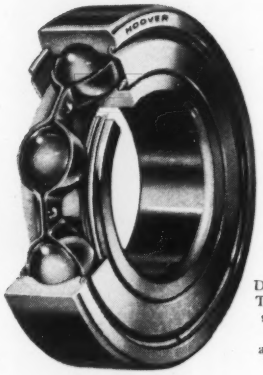
1 The best material
2 Unit safety factor (on bodies, rings, links, hooks)
3 Proof test of complete sling to twice the working load limit
4 Actual field service test of each design
5 Metal identification ring on each sling
6 Signed Registry Certificate with each sling

American Chain Division
AMERICAN CHAIN & CABLE
Bridgeport, Conn. • Factories: *York and *Braddock, Pa.

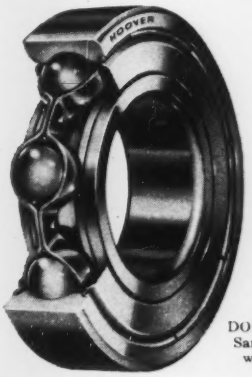
Sales Offices: *Atlanta, Boston, *Chicago, *Denver, Detroit, *Houston, *Los Angeles, *New York, Philadelphia, Pittsburgh, *Portland, Ore., *San Francisco

Indicates Warehouse Stocks

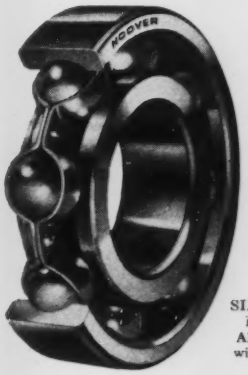
ACCO
TRADE MARK



DOUBLE SEAL—
Teflon contact seal shown. Available with snap ring and with single or double seal.

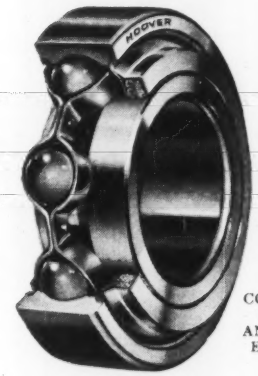


DOUBLE SHIELD—
Same sizes available with single shield.

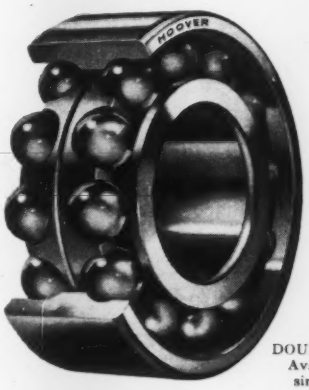


SINGLE ROW RADIAL—
Also available with snap ring.

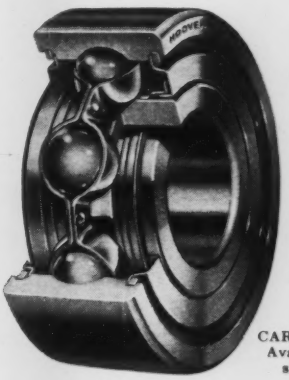
when you want quality



COMBINATION FELT SEAL AND SHIELD—
Either standard or wide outer ring.



DOUBLE ROW—
Available with single shield.



CARTRIDGE—
Available with snap ring.

you want hoover

When you want *quality* bearings to add to the performance, long life and smooth operation of your products, you want Hoover Ball Bearings.

Hoover Ball Bearings combine the exactness of *Micro-Velvet* Lapped Balls with the smoothness of *Hoover Honed* Raceways. The result . . . top quality bearings that assure unexcelled performance—quietness—long life—and heavy load capacity.

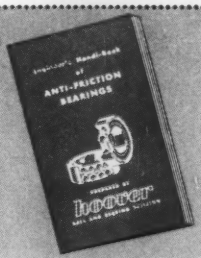
Investigate Hoover's line of ball bearings in the light, medium and heavy series. Their microscopic precision adds up to your best buy in ball bearings. Manufacturers are invited to call in Hoover engineers for technical assistance. Write for information.

Micro-Velvet and *Hoover Honed* are Hoover Trademarks.

HOOVER BALL AND BEARING COMPANY, ANN ARBOR, MICHIGAN

Send information about

- ☐ Single Row Radial Bearings
- ☐ Bearings with Shields
- ☐ Bearings with Seals
- ☐ Combination Shield and Seal
- ☐ Cartridge Bearings
- ☐ Double Row Bearings



Hoover Ball and Bearing Company, Ann Arbor, Mich.

Please send information checked. Mail copy of "Hoover Handi-Book of Anti-Friction Bearings."

Name_____

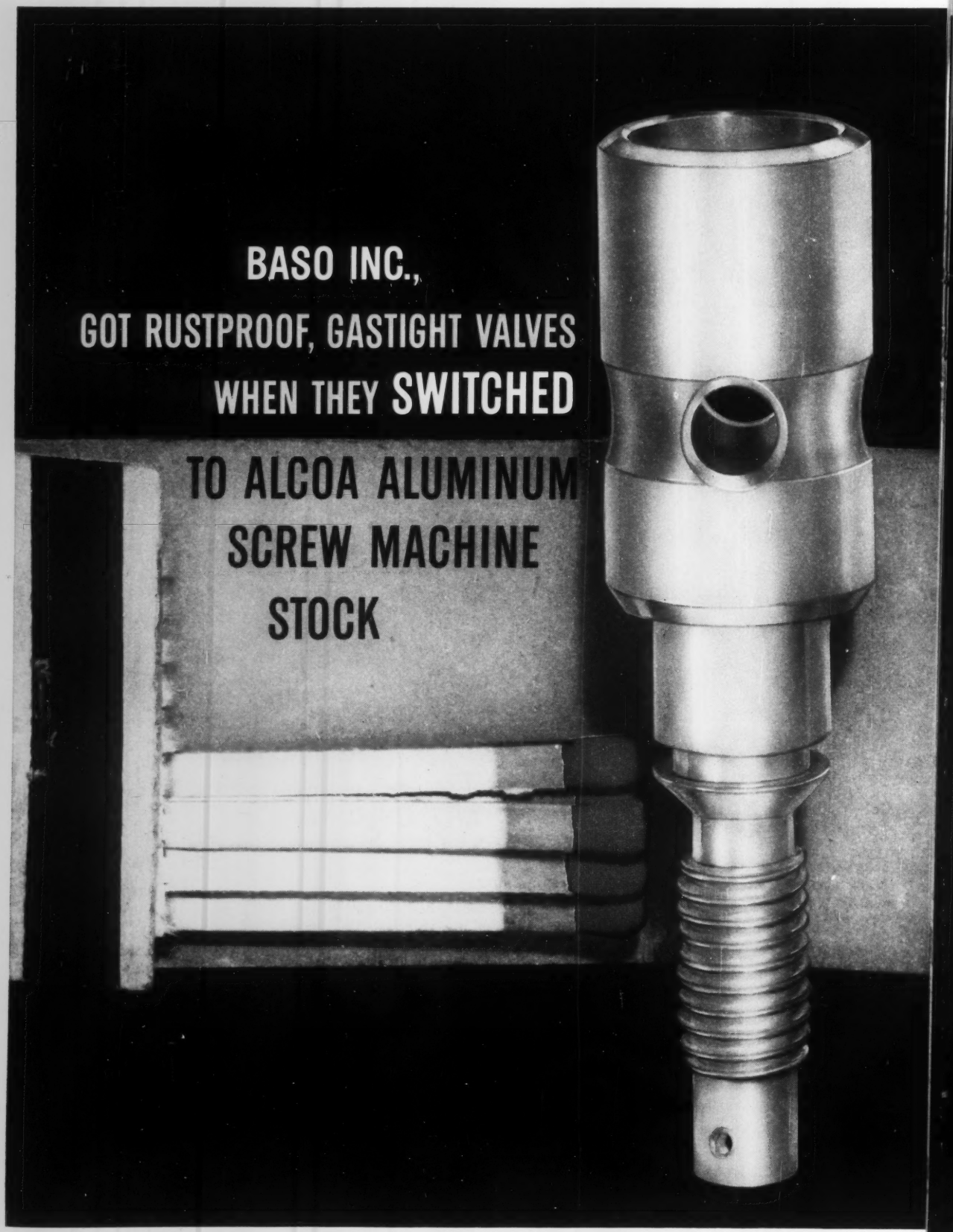
Title_____

Company_____

Address_____

City_____ State_____

S-10


BASO INC.,
GOT RUSTPROOF, GASTIGHT VALVES
WHEN THEY SWITCHED
TO ALCOA ALUMINUM
SCREW MACHINE
STOCK

Baso Inc., pioneered the thermoelectric controls that make wonderful things happen in America's homes. Gas ranges, clothes dryers, heating units turn themselves on and off automatically.

Brass was formerly used for Baso valve cocks, but these parts were converted to aluminum in conjunction with a complete switch to aluminum for valve bodies. This change entirely eliminated any corrosion problem that might occur between dissimilar metals. With one pass of a single-point tool, Baso gets a surface finish of 16 micro inches in a cycle time of 18 seconds (machine capacity). The lapping operation required with brass was eliminated and so were gaskets, for the metal-to-metal aluminum seal proved to be gastight.

If you machine parts from steel or brass, now is the time to take a hard look at these economic facts about aluminum:

1. Aluminum costs less than brass, and machines just as fast.
2. Aluminum machines faster than steel and won't rust.
3. Aluminum scrap allowance is high.

Now is the time to switch to Alcoa® Aluminum. To help you make that switch, call on your nearest Alcoa sales office. For immediate delivery of screw machine stock, contact your nearest Alcoa distributor. ALUMINUM COMPANY OF AMERICA, 874-H Alcoa Building, Pittsburgh 19, Pa.

IN DESIGN

Russell Matthews, Director of Product Engineering (left), discusses aluminum backing for valve facing with James Dowd, Director of Industrial Engineering. Mr. Matthews says, "Alcoa helped us start redesigning with aluminum back in 1948. Our conversion from brass is now complete."

IN PURCHASING

Mr. G. C. Winters, Director of Purchasing, says, "We have never had to reject Alcoa stock either from the mill or from its local distributor. We find both very cooperative in making deliveries to meet production schedules, thereby saving us warehouse space."

Visit the Alcoa-National Acme Cooperative Machining Demonstration, National Acme Company, Cleveland, Ohio, September 10 and 11, 1957

ALCOA ALUMINUM SCREW MACHINE STOCK

WE CHOSE ALCOA ALUMINUM SCREW MACHINE STOCK

✳ LEARN WHY OTHER COMPANIES HAVE *SWITCHED TO ALCOA ALUMINUM*

Direct quotes from leaders in industry on why they buy from Alcoa. Fill out coupon for your copy.

Name_____

Title_____

Company_____

Address_____

City_____ State_____

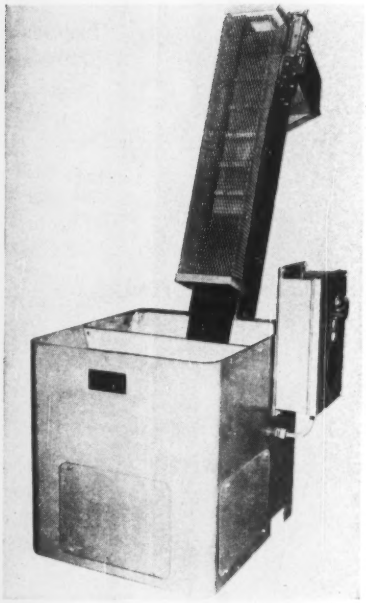
NEW PRODUCTS and equipment

ture (77° F minimum) for 24 hours, the adhesive reaches maximum strength after seven days. Curing for 4 hours at 120-140° F develops maximum strength at once.

The adhesive consists of a synthetic resin base and an activator. Metal, glass, ceramics, or wood can also be bonded to metal. Other uses of the adhesive are as a protective coating, sealing, and casting compound. *Write*: Adhesives Dept., Raybestos-Manhattan Inc., Bridgeport 2, Conn. *Phone*: Edison 7-3341

Bulk Loader

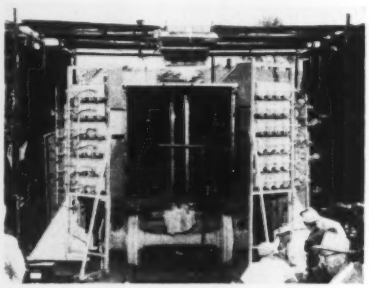
Model 2400 is a self-contained loader with a 4 cu ft hopper. Metal cleats on the moving conveyor pick up parts from the hopper and elevate them for delivery into the vibrator feeder.



The loader can be modified to feed rolling or sliding parts. *Write*: Feedall Inc., 38399 Pelton Rd., Willoughby, Ohio. *Phone*: Willoughby 2-8100

Rays Thaw Iron Ore

In minutes, infrared rays produced by a gas generator will thaw 80 tons of iron ore frozen to a depth of 6 or 8 in. on all sides in a railroad car.

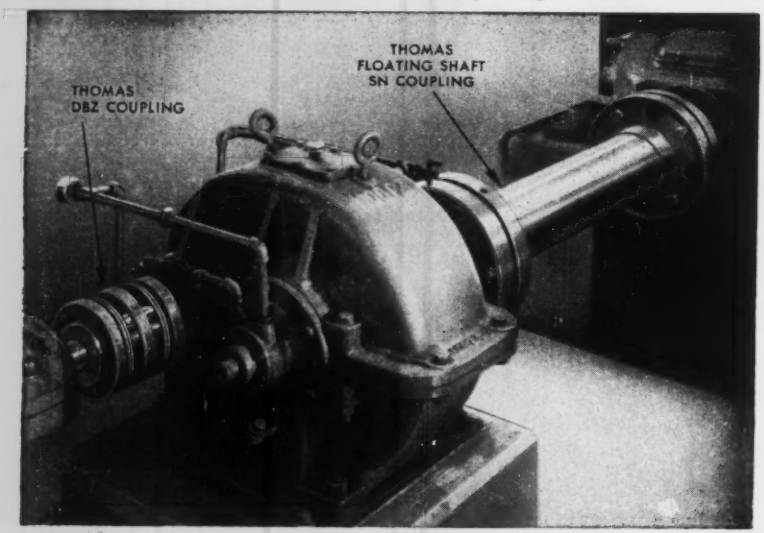


The equipment can also be used for thawing coal cars. It uses a bank of German-developed heating units known as Perfection Schwank Gas Infrared generators.

The generator achieves an operating temperature of 1650° F by burning gas on the surface of a ceramic mat. The gas is converted into infrared energy in wave lengths readily absorbed. Perfection Industries Div., Hupp Corp., 1135 Ivanhoe Rd., Cleveland 10, Ohio. *Phone*: Ulster 1-6200

THOMAS FLEXIBLE COUPLINGS

Give You Freedom From Coupling Maintenance



NO LUBRICATION **NO MAINTENANCE** **NO WEARING PARTS**

Future maintenance costs and shutdowns are eliminated when you install Thomas Flexible Couplings. These all-metal couplings are open for inspection while running.

They will protect your equipment and extend the life of your machines.

Properly installed and operated within rated conditions, Thomas Couplings should last a lifetime.

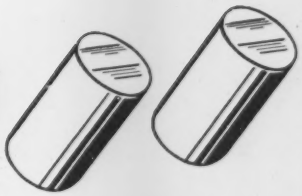
Under Load and Misalignment only Thomas Flexible Couplings offer all these advantages:

1 Freedom from Backlash Torsional Rigidity
2 Free End Float
3 Smooth Continuous Drive with Constant Rotational Velocity
4 Visual Inspection While in Operation
5 Original Balance for Life
6 No Lubrication
7 No Wearing Parts
8 No Maintenance

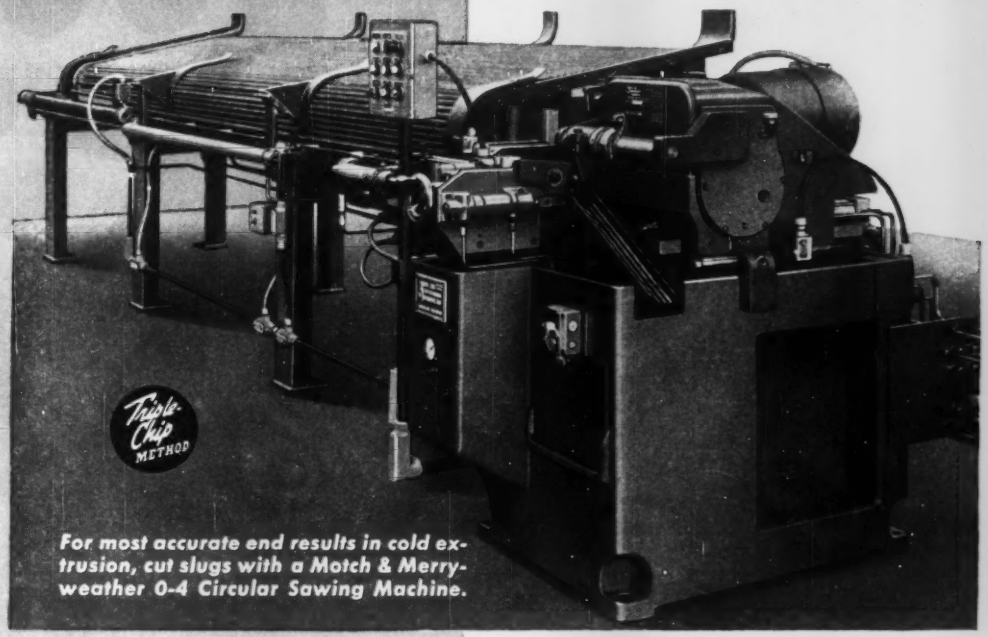
Write for Engineering Catalog 51A

THOMAS FLEXIBLE COUPLING COMPANY
WARREN, PENNSYLVANIA, U.S.A.

cold cuts

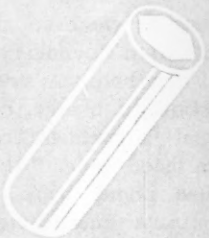


BY MOTCH & MERRYWEATHER



For most accurate end results in cold extrusion, cut slugs with a Motch & Merryweather 0-4 Circular Sawing Machine.

. . . make better COLD EXTRUDED PARTS

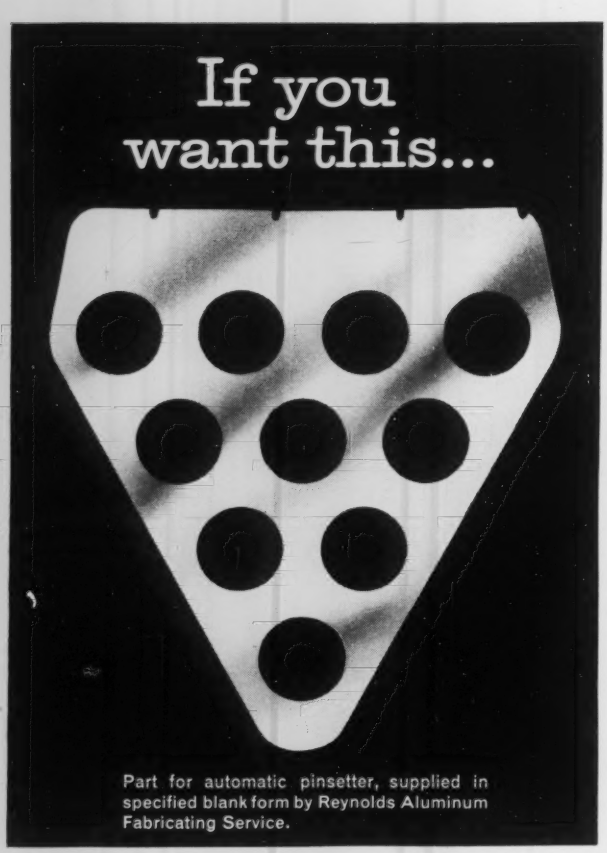


The Motch & Merryweather No. 0-4 Precision Circular Sawing Machine is automatic from the storage table to the finished cut slug. It cuts slugs accurate to ±.002" with uniformly square ends and minimum burr. Give your cold extrusion press the opportunity of producing more work than ever before, with more accuracy than ever before, at a lower cost per piece than ever before.

THE MOTCH & MERRYWEATHER MACHINERY CO.

MACHINERY MANUFACTURING DIVISION
CLEVELAND 13, OHIO

Builders of Automatic Precision Cut-Off, Milling and Special Machinery



Part for automatic pinsetter, supplied in specified blank form by Reynolds Aluminum Fabricating Service.

Aluminum punched out of blank, remelted by Reynolds Fabricating Service to eliminate scrap loss for customers.

Use Reynolds Aluminum Blanks

When you're buying metal for a part like that shown above it's a case of "who pays for the hole in the donut?" There's almost as much scrap metal as part metal.

You can solve this wasteful problem—when the part is aluminum—with Reynolds blanks. The shearing, cutting, piercing and punching is done before the metal is shipped to you. You have no scrap loss; you save scrap, shipping, handling and storing costs; you save production time and problems . . . you buy only the metal you use.

Reynolds Aluminum Fabricating Service can provide aluminum blanks to your specifications to help you save in purchasing, production and handling. Next time you have to produce or work an aluminum part, get a quote from Reynolds on aluminum blanks. It may help you save.

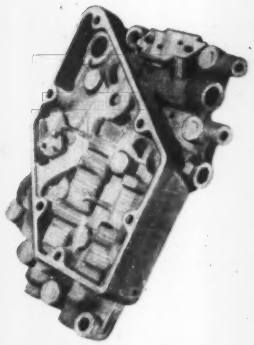
For information on blanks, completed parts and final assemblies, call your Reynolds office listed under "Aluminum" in the classified phone book, or write *Reynolds Aluminum Fabricating Service, 2063 S. Ninth St., Louisville 1, Kentucky.*

The Finest Products Made with Aluminum are made with REYNOLDS ALUMINUM

REYNOLDS ALUMINUM
Fabricating Service

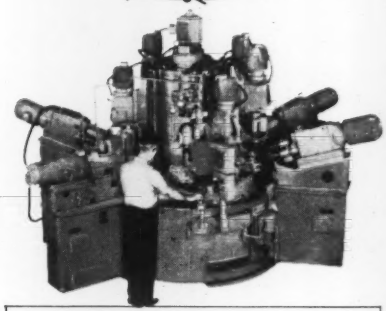
BLANKING • EMBOSSING • STAMPING
DRAWING • RIVETING • ROLL SHAPING
TUBE BENDING • WELDING • BRAZING • FINISHING

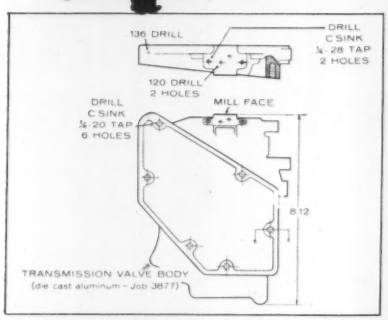
See "CIRCUS BOY", Sundays, NBC-TV. Watch for Reynolds on "DISNEYLAND", ABC-TV.



- drills
- c'sinks
- taps
- mills

460 PER HOUR GROSS





Milling is at high speed—7200 rpm. Five vertical units on the center column operate on the holes in the milled face. Three angular units operate on the six mounting holes. The machine has a 60-inch index table with eight stations.

A Kingsbury indexing automatic is the best way to perform drilling types of operations—

—at a high production rate
—at low unit cost
—with unvarying accuracy.

Kingsbury Machine Tool Corporation, Keene, New Hampshire.

KINGSBURY

INDEXING AUTOMATICS for high production drilling and tapping

NEW literature

Write directly to the company for a copy

Free Machining Steel

Bulletin 14-8, 4 pages, describes a carbon-manganese, case hardening steel. Joseph T. Ryerson & Son Inc., Box 8000-A, Chicago 80, Ill.

Titanium Carbide

Physical properties of 13 titanium carbide alloys and their applications are covered in Bulletin B-444, 12 pages. Kennametal Inc., Latrobe, Pa.

Silicone Grease

Bulletin 6-209, 4 pages, describes silicone-base grease for use at —40 to 400° F. Dow Corning Corp., Midland, Mich.

Bushings

This 6-page bulletin lists bushing types and sizes, drill sizes with their decimal equivalents, concentricity of bushings, and Rockwell hardness. American Drill Bushing Co., 5107 Pacific Blvd., Los Angeles 58, Calif.

Machining Setups

A combination clamp and jack for jobs on boring mills, planers, milling machines, presses, and drill presses is described in Bulletin 557, 8 pages. Universal Vise & Tool Co., Parma, Mich.

Variable Speed Lathes

A series of 11 and 13-in. lathes is covered in a 4-page bulletin. Sheldon Machine Co. Inc., 4258 N. Knox Ave., Chicago 41, Ill.

Shaft Mounted Drives

This 4-page selection table covers drives with a ratio of 24:1 in ½ to 30-hp models. Dept. 255, Falk Corp., 3001 W. Canal St., Milwaukee 1, Wis.

Motor Starters

Manual starters for motors to 7½ hp are described in Bulletin GEA-6358A, 8 pages. General Electric Co., Schenectady 5, N. Y.

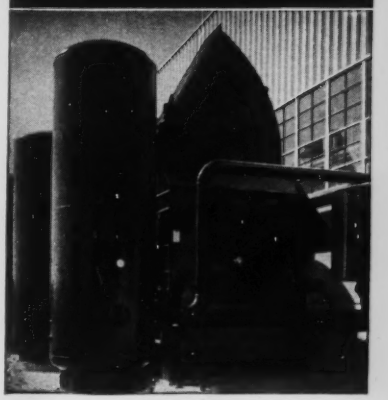
Lift Trucks

Bulletin BU-334A, 6 pages, describes 10,000 lb lift trucks powered by gasoline, LP-gas, or diesel engines. Buda Div., Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Shock Tester

Bulletin 4-70, 12 pages, describes a dynamic instrument for the accurate simulation of shock experienced

HOW YOU SAVE . . .



. . . getting drier Compressed Air

Direct saving in the cost of cooling water saves the price of the Niagara Aero After Cooler (for compressed air or gas) in less than two years.

Extra, for no cost, the drier air gives you a better operation and lower costs in the use of all air-operated tools and machines, paint spraying, sand blasting or moisture-free air cleaning. Water saving also means less expense for piping, pumping, water treatment and water disposal, or you get the use of water elsewhere in your plant where it may be badly needed.

Niagara Aero After Cooler assures all these benefits because it cools compressed air or gas below the temperature of the surrounding atmosphere; there can be no further condensation in your air lines. It condenses the moisture by passing the air thru a coil on the surface of which water is evaporated, transferring the heat to the atmosphere. It is installed outdoors, protected from freezing in winter by the Niagara Balanced Wet Bulb Control.

Write for Bulletin No. 130.
Address Dept. S-8.

NIAGARA BLOWER COMPANY
405 Lexington Ave., New York 17, N.Y.
District Engineers
in Principal Cities of U. S. and Canada

Westinghouse mill motors with **silicone insulation**

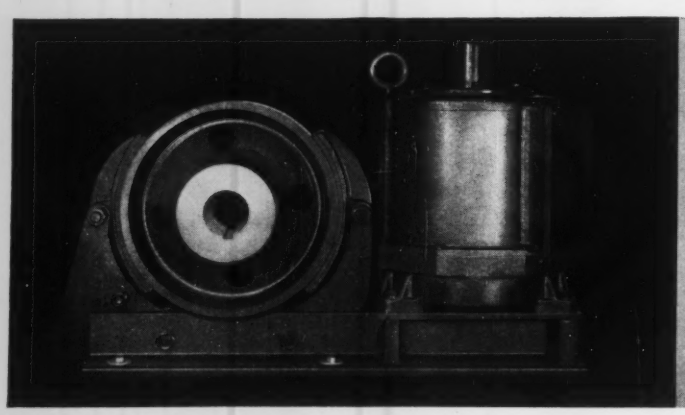
For longer motor life under the toughest operating conditions

Silicone insulation for longer motor life . . . improved field coil design for greater capacity and cooler operation . . . heavy-duty shaft, bearing and housing design to take high torque loads . . . make the Westinghouse Hevi-Duty Mill Motor the most rugged package of power you can buy.

New silicone insulated armatures and the exclusive Westinghouse solid mass design with multi-dip finishing make it five times tougher for load surges to affect armature coils.

Maintenance is easy, too. New openings in lower frame give quick, easy access to commutator and brush rigging for inspection or repair. Silicone-insulated armatures and field coils are interchangeable with old-style units.

For complete information on the outstanding Westinghouse Hevi-Duty Mill Motor, call your Westinghouse sales engineer. Or, write Westinghouse Electric Corporation, 3 Gateway Center, P.O. Box 868, Pittsburgh 30, Pennsylvania. Ask for B-6547. J-22049



WESTINGHOUSE ALSO OFFERS:
The Only Self-Adjusting D-C Magnetic Brake

When selecting mill motors remember that Westinghouse can furnish motors and brakes as one unit. Only Westinghouse D-C Magnetic Brakes are self-adjusting. This exclusive self-adjustment design means long brake life and minimum maintenance. For more information on the only Self-Adjusting D-C Magnetic Brake on the market ask for B-6548.

YOU CAN BE SURE...IF IT'S Westinghouse

NEW LITERATURE

by equipment in use. The tester produces thrusts up to 12,000 lb instantly with precision waveform control. Rochester Div., Consolidated Electrodynamics Corp., 1775 Mt. Read Blvd., Rochester 3, N. Y.

Speed Reducers

Selection tables, design features, dimensions, horsepower ratings, and service factors of spiral-bevel speed reducers are included in this 40-page catalog, SB-517. Philadelphia Gear Works Inc., Erie Avenue and G Street, Philadelphia 34, Pa.

Die Sets

Precision and commercial die sets, both the standard two pin series and the rear two pin rectangular series are described in Bulletin 70-A, 20 pages. Die Supply Div., E. W. Bliss Co., 1400 Brookpark Rd., Cleveland 9, Ohio.

Industrial Gases

Bulletin ADC 663A, 16 pages, describes the bulk delivery method of handling industrial gases in large quantities. Air Reduction Sales Co., division of Air Reduction Co. Inc., 159 E. 42nd St., New York 17, N. Y.

From first heat to heat treat . . .

LOFTUS

designs and builds them better

International Harvester Co., West Pullman Works

COVER TYPE
ANNEALING FURNACES

DIRECT-FIRED SINGLE-STACK
Generally Recommended
for
Greater Productivity per Investment Dollar
and
Flexibility with Economy

LOFTUS
Engineering Corporation
1 Gateway Center, Pittsburgh, Pa.
140 S. Dearborn St., Chicago. Ill.

57.12.4

Feeders

Bulletin 5742, 10 pages, describes blank units for developing vibratory feeders. Vibratory Feeder Co., division of Automation Devices Inc., Erie, Pa.

Conveyor Rollers

This 4-page bulletin depicts rollers and frames for gravity and live roller conveying systems. Alvey-Ferguson Co., 1886 Disney St., Cincinnati 9, Ohio.

Contours Grinding Wheels

Inclined plane cam mechanisms for dressing grinding wheels to intricate contours are described in this 6-page bulletin. Hoglund Engineering & Mfg. Co. Inc., 343 Snyder Ave., Berkeley Heights, N. J.

Hubs and Bushings

Steel hubs and malleable split taper bushings for mounting parts to shafts with a positive locking clamp fit are desecribed in Bulletin HB-101-A, 4 pages. Browning Mfg. Co., Maysville, Ky.

Protective Coating

Bulletin 88, 4 pages, describes a pigmented polyvinyl chloride resin compound applied by brush, spray, or roller. Amercoat Corp., 4809 Firestone Blvd., South Gate, Calif.

Press Feeders

This booklet describes 9 and 12-in. cam operated units that will handle coiled stock up to 3/16 in. thick. H. E. Dickerman Mfg. Co., 321 Albany St., Springfield, Mass.

Refractory Mortars

Bulletin 852, 4 pages, describes high temperature bonding mortars. Refractory Dept., Denver Fire Clay Co., 2301 Blake St., Denver, Colo.

Welded Steel Tubing

Tolerance charts for cold rolled steel, hot rolled steel, cut lengths, rounds, squares and rectangulars, and propeller shaft tubing are included in this pocket-size booklet. Rome Mfg. Co. Div., Revere Copper & Brass Inc., P.O. Box 111, Rome, N. Y.

Wire Drawing

Lubricants and the finish obtained from them are discussed in this 43-page catalog. Standard Industrial Compounds Co. Inc., Frankfort, Ill.

Way Unit

Bulletin 357, 12 pages, describes a heavy duty way unit for drilling, reaming, spotfacing, boring, and

Anaconda Aluminum Coiled Sheet

ALUMINUM COILED SHEET produced to the high standards of quality and uniformity maintained by The American Brass Company is now available for prompt shipment from our Torrington Division to all points in the United States.

It is rolled on the most modern, high-speed equipment, X-ray controlled to close tolerance in gage. High-speed, electronically operated slitters give exact widths with clean edges on evenly and tightly wound coils. Latest annealing furnaces—with controlled atmosphere and temperature—provide high uniformity of metal structure to meet specified mechanical-property limits.

IN THESE WIDTHS: Maximum 28 inches
Minimum 3/8 inch

IN THESE THICKNESSES: Maximum 0.064 inch
Minimum .006 inch

COIL WEIGHTS: Up to 100 lb. per inch of width

ARBOR SIZES: 4, 6, 8, 10, 12, 16, and 20 inches in diameter

ALLOYS: 1100, 3003, 3004, 5005, 5050, 5052

TEMPERS: Alloy Nos. 1100, 3003, 5005
–O, –H12, –H14, –H16, –H18
Alloy Nos. 3004, 5005, 5050, 5052
–O, –H32, –H34, –H36, –H38

FOR IMMEDIATE ACTION, call The American Brass Company Office nearest you. The American Brass Company, Waterbury 20, Conn. 5794

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ALUMINUM COILED SHEET
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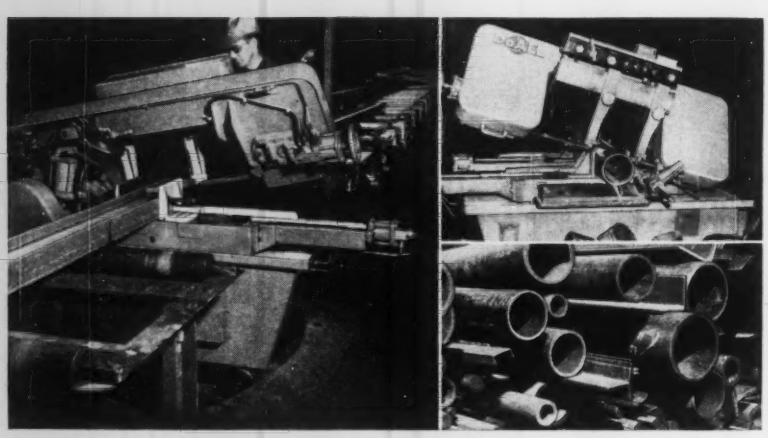


A NEW SAWING MACHINE that cuts metal faster at lower cost.

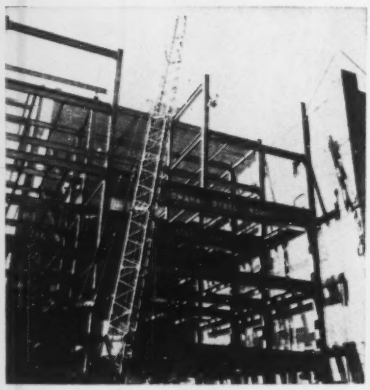
Building America with "Tools" . . .

Men with axes and strong backs built the first buildings in America. Now the "tools" of building are steel mills and cranes, riveting hammers and sawing machines.

The man with the modern tool is way ahead of the pioneer with the axe. Because he produces more, he owns more. And every time he is provided with a more efficient tool he becomes more productive. Everybody benefits. America grows stronger and its people enjoy great abundance.

The picture above provides an example of this process. The new DoALL bandsawing machine is helping build a skyscraper and a way of life. It is cutting-off structural steel at lower cost than any previous machine for the purpose. Its continuous-cutting saw band is made of *high speed steel* which cuts up to 10 times faster and lasts up to 30 times longer than ordinary carbon steel bands. Thus, tool cost is lower and wasteful downtime is reduced. The cut is clean. No man-hours need be wasted removing burrs, as was the case with the saw formerly used.

The Power Saw is used in manufacturing for high production sawing. When many pieces of the same length are required, it is equipped to automatically feed, index and cut-off one piece after another.



From skyscrapers to schools, America is built with tools.

From the axe to the Power Saw, tools have built America. Only through continuously greater use of new and better tools can progress continue and living improve for more and more people.

The DoALL Company offers industry more than 1500 new and better machine tools, cutting tools and gaging tools to increase human productivity.

Reprints of this series on economics plus "economic kits" available for employee education.

ASK FOR DoALL POWER SAWING HANDBOOK describing how to cut cut-off costs. Free on request. Call DoALL locally, or write.

The DoALL Company
Des Plaines, Illinois
38 Local Sales-Service Stores E-39

NEW LITERATURE

counterboring. Avey Div., Motch & Merryweather Machinery Co., Box 625, Cincinnati 1, Ohio.

X-Ray

This 2-page bulletin describes an x-ray unit capable of making radiographs of thin magnesium and steel up to 3 in. thick. Balteau Electric Corp., New and Meadow Streets, Stamford, Conn.

Semipressure Fans

Bulletin 400, 8 pages, describes fans with diameters from 14 to 60 in. Aerovent Fan Co. Inc., Piqua 69, Ohio.

Fractional Motors

Bulletin GEA-6424, 16 pages, describes general purpose fractional horsepower motors used in the equipment manufacturing field. General Electric Co., Schenectady 5, N. Y.

Shear Knife Handbook

An 88-page book gives information for selecting the correct grade of shear knife, tolerances and setting suggestions. American Shear Knife Co., P.O. Box 355, Homestead, Pa.

Stop Valve

This 8-page bulletin, S-3A, describes a combined throttle and automatic stop valve for automatically shutting down a turbine, compressor, or engine in case of overspeed. Golden-Anderson Valve Specialty Co., 1252 Ridge Ave., Pittsburgh 33, Pa.

Friction Clutch and Brake

This 4-page bulletin, 37-A, explains the single disc press clutch. A cutaway illustration shows the inner workings of the clutch. E. W. Bliss Co., Canton, Ohio.

Automatic Welding

Equipment for consumable electrode, gas shielded welding is described in Bulletin GEC-1334B, 4 pages. General Electric Co., Schenectady 5, N. Y.

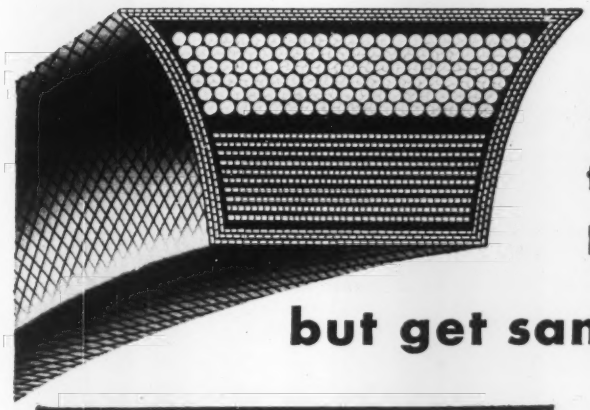
Cranes

Full, semi, and special gantry cranes are described in Bulletin G-203, 4 pages. Chicago Tramrail Corp., 1330 S. Kostner Ave., Chicago 23, Ill.

Binding Posts

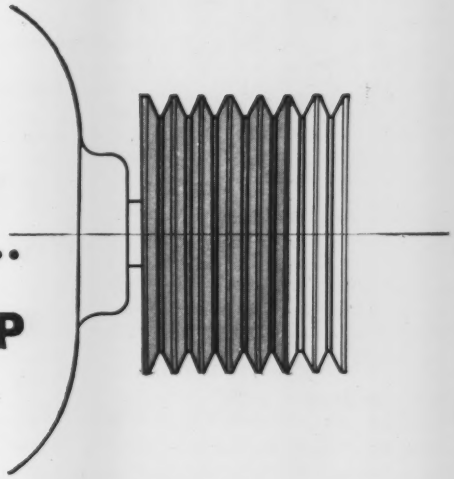
Bulletin BP656, 4 pages, describes binding posts, available in five colors, with capacity of 30 amperes and

5 Gates Super Vulco Ropes do the work of 7 standard V-belts



Use fewer belts...

but get same HP

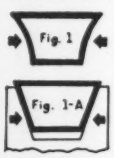


No other V-Belt has ALL these advantages

1. Flex-Weave Cover (U.S. Pat. 2519590)

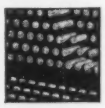
A Gates exclusive: provides greater flexibility with far less stress on fabric. Cover wears longer . . . increases belt life . . . more power available to driven machine.

2. Concave Sidewalls (U.S. Pat. 1813698)



Concave sides (Fig. 1) increase belt life. As belt bends, concave sidewalls become straight, making uniform contact with sheave groove (Fig. 1-A). Uniform contact means less wear on sides of belt . . . far longer belt life.

3. Tough, resilient Tensile Cords



Super strong resilient tensile cords provide 40% greater horsepower capacity . . . easily absorb heavy shock loads . . . reduce number of belts required save weight and space.

4. High Electrical Conductivity

Built into Gates Super Vulco Ropes for safer drives (in explosive atmospheres).

5. Oil, Heat, Weather Resistant

Special rubber compounds make Super Vulco Ropes highly resistant to heat, oil, and prolonged exposure to weather.

Cut sheave width and weight . . . design your drive to benefit from the greater HP capacity of Gates Super Vulco Ropes.

5 Gates Super Vulco Ropes will do the work of 7 Standard V-Belts. A Super Vulco Rope Drive delivers more HP per dollar invested than any standard V-Belt drive.

Sheaves with fewer grooves cost less . . . weigh less . . . occupy less space. Your drive design is improved.

Helpful drive data is quickly available to you. Simply call your nearby Gates distributor for advice from a Gates V-Belt Specialist. Stocks carried in industrial centers throughout the world.

The Gates Rubber Company

Denver, Colorado

TPA 264

Gates

The Mark of *Specialized* Research

Gates Super VULCO ROPE Drives

NEW LITERATURE

working voltage of 1000. Dept. BP, Superior Electric Co., 83 Laurel St., Bristol, Conn.

Drive Units

Electromagnetic cycling units are described in a 12-page bulletin. Cycledynamics Inc., 19025 W. Davison, Detroit 23, Mich.

Stainless Steel

This 32-page bulletin describes properties and uses of stainless sheets and strip. Advertising Dept. Allegheny Ludlum Steel Corp., Oliver Bldg., Pittsburgh 22, Pa.

Tungsten Arc Welding

A complete line of equipment for the Heliweld process is described in Bulletin 2300, 20 pages. Air Reduction Sales Co., division of Air Reduction Co. Inc., 150 E. 42nd St., New York 17, N. Y.

Steel Buildings

Bulletin SX-2056, 32 pages, describes five types of buildings available in more than 5000 sizes. Product Information Service, Armco Drainage & Metal Products Inc., Middletown, Ohio.

Zirconium Oxides

Uses, manufacturing methods and physical properties are listed in Bulletin 57, 4 pages. Zirconium Corp. of America, Solon, Ohio.

Flexible Shafts

Bulletin 57, 6 pages, covers flexible shaft machines, saw attachments, hole cutters, and related items. Wyzenbeek & Staff Inc., 223 N. California Ave., Chicago 12, Ill.

Pneumatic Control

Automatic control systems and pneumatic recording and indicating controllers are described in Bulletin A130, 44 pages. Bristol Co., Waterbury 20, Conn.

Tube Tolerances

A chart (Section B, No. 1) lists tolerances for seamless and welded mechanical tubing, and stainless steel tubing and pipe. Peter A. Frasse & Co. Inc., 17 Grand St., New York 13, N. Y.

Ovens

Industrial ovens for baking, drying, curing, and heat treating are described in Bulletin 157, 16 pages. Dept. B-54, Young Bros Co., 1831 Columbus Rd., Cleveland 13, Ohio.

Rivets

Tables giving the weights of 1000 rivets are presented in this 24-page bulletin. Burrs and washers are included. Cobb & Drew Inc., Plymouth, Mass.

Blind Rivets

Cross-sectional drawings in this 10-page bulletin show typical applications of blind rivets. Huck Mfg. Co., 2480 Bellevue Ave., Detroit 7, Mich.

Spray Booths

Catalog I-7000, 36 pages, discusses spray booths and exhaust systems, custom designed or ready-made. DeVilbiss Co., Toledo 1, Ohio.

Resistors

The 36-page catalog GEA-6592, describes vitreous enameled stock resistors rated from 5 to 1200 watts. General Electric Co., Schenectady 5, N. Y.

Gas Chemistry

Bulletin SC-178, 8 pages, describes atmosphere heat treating and gas chemistry and their ability to upgrade and protect metals. Surface Combustion Corp., 2375 Dorr St., Toledo 1, Ohio.

NEW LITERATURE

Gear Motors

Right angle units of ¼ to 5 hp are presented in this 4-page bulletin. Sterling Electric Motors Inc., 5401 Telegraph Rd., Los Angeles 22, Calif.

Porcelain Enamel

Design factors and technical data for using porcelain enamel panels are given in this 28-page bulletin. Porcelain Enamel Institute, 1145 19th St. N.W., Washington 6, D. C.

Industrial Tires

Specifications for all types of industrial tires are given in this 36-page catalog. B. F. Goodrich Tire Co., Akron, Ohio.

Rotary Pump

A pump for lubricating vertical shaft machinery is described in this 2-page bulletin, TR 57A. Bijur Lubricating Corp., 151 W. Passaic St., Rochelle Park, N. J.

Plastic Pipe

Pressure drops, pressure-temperature ratings, and pumping depths for plastic pipe and fittings are tabulated in this 8-page bulletin. Crane Co., 836 S. Michigan Ave., Chicago 5, Ill.

Ductile Iron

Bulletin 14, 2 pages, lists the properties of ductile iron and the effect of heat treatment. Advance Foundry Co., 107 Seminary Ave., Dayton 3, Ohio.

Overhead Cranes

Briges, end trucks, trolleys, and controls for double girder overhead cranes are described in this 12-page bulletin, HD 1000. Industrial Crane & Hoist Corp., 1536 S. Paulina St., Chicago 8, Ill.

Grinding Wheels

This 2-page bulletin, data sheet No. 5, contains recommendations for surface, cylindrical, internal, centerless, and toolroom grinders. Wall Colmonoy Corp., 19345 John R. St., Detroit 3, Mich.

Hydraulic Pumps

This 52-page catalog describes a line of 3000 psi cylinders in ½, ¾, 1, 1¼ and 1½-in. bore sizes. Oil-Dyne Inc., 2117E W. Marquette Rd., Chicago 36, Ill.

Blind Rivets

This 16-page bulletin describes the driving cycle of conical lock rivets. Huck Mfg. Co., 2480 Bellevue Ave., Detroit 7, Mich.

Wall Chart

Code name designations for aluminum electrical conductors are listed alphabetically on this wall chart. It includes data on coverings, messengers, sizes, and strandings. Kaiser Aluminum & Chemical Sales Inc., 919 N. Michigan Ave., Chicago 11, Ill.

Air Gage

Air accessories are covered in this 32-page catalog, 57D. Federal Products Corp., 1144 Eddy St., Providence 1, R. I.

Abrasive Tools

Actual size drawings of mounted grinding wheels are included in this 8-page bulletin, ESA 67. All sizes and shapes are illustrated. Simonds Abrasive Co., Tacony and Fraley Streets, Philadelphia 37, Pa.

Wedge Bar Chart

This chart helps determine the correct wedge bar for rebuilding worn teeth. It determines the metal worn

Let your Pennsalt salesman work with you to improve metalworking with chemical know-how . . . in cold working, cleaning, plating, and organic finishing. Learn more about Pennsalt service—mail the coupon.

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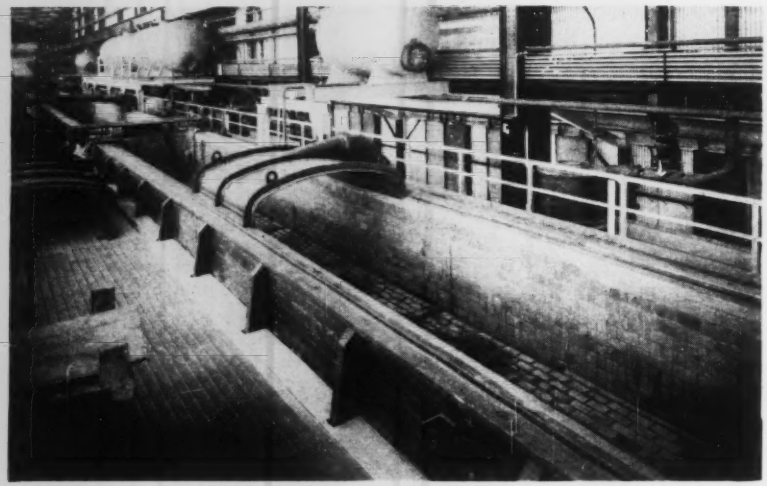
PICKLE-TANK CONSTRUCTION



...EXPERIENCE!

Since Atlas installed the first continuous brick-lined pickler in 1933, more than 10,000,000 pounds of Atlas corrosion-proof materials of construction have been used to build all types and styles of pickling tanks throughout the world. The huge pickling tank pictured above was recently installed in a large eastern steel mill and is a typical example of Atlas design and construction in the metalworking field.

Experience has taught us a successful pickling tank requires an integrated combination of highest quality materials, tested and proven design, expert and craftsman-like construction. Only Atlas offers such a service ... a sole source of responsibility, standing behind their installation, controlling every step of the job, from the basic manufacture of the products to the final use of the material.

Why choose the average when you can benefit from the BIG difference of an Atlas pickling tank? One that will be a permanent asset ... deliver full service ... withstand the rugged abuse of modern pickling operations and not be hampered by down-time for repair of corrosion damage. Make sure you specify ATLAS for your next installation.

Write for Bulletin CC-3 giving complete information on the Atlas line.

ATLAS MINERAL PRODUCTS COMPANY
MERTZTOWN, PENNSYLVANIA

NEW LITERATURE

away by impact or abrasion on shovel or dragline buckets. Stulz-Sickles Co., Port Avenue at Julia Street, Elizabeth, N. J.

Valves

Bulletin HB-6, 8 pages, describes a line of valves for hard to handle fluids. Conoflow Corp., 2100 Arch St., Philadelphia 3, Pa.

Rust Remover

An alkaline compound that removes rust, paint, and primer from metal surfaces in two steps without the use of acids is described in a 4-page bulletin. Turco Products Inc., 6135 S. Central Ave., Los Angeles 1, Calif.

NEW BOOKS

Cast Metals Handbook, American Foundrymen's Society, Golf & Wolf Roads, Des Plaines, Ill. 320 pages. $10.

This engineering reference book enables the user of cast metals to select the material best suited to his purpose. It contains working data on the properties of cast metals and information on the latest developments.

Filler Metal Comparison Charts. American Welding Society, 33 W. 39th St., New York 18, N. Y. 24 pages, $2.

Brand names of 61 companies are included in these charts covering 12 ASW-ASTM specifications.

The Making, Shaping and Treating of Steel, Seventh Edition, Office Service-Stores, U. S. Steel Corp., 525 William Penn Place, Pittsburgh 30, Pa. 932 pages, $7.50.

Here is a comprehensive summary of theory and practice of all phases of iron and steel production from raw materials to finished products.

Included are: Refractories; iron ores; fluxes and slag; addition agents; steel scrap; blast furnace practice; pneumatic, open hearth, and electric furnaces; duplex and triplex steelmaking; steel and iron castings; heating methods; rolling mills; rolling and forging practices; steel conditioning; protective coatings; heat treatment, and mechanical testing.

Manufacture and properties of carbon and alloy steel and the products made from them are discussed extensively.

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4-HIGH 4-STAND TANDEM BRASS MILL

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ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at Pittsburgh, Vandergrift, Youngstown, Canton, Wilmington

SUBSIDIARIES: Adamson United Company, Akron, Ohio
Stedman Foundry and Machine Co., Inc., Aurora, Indiana

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

COMMISSIONED TO PUT OUR GUARD UP HIGH . . .
AIRCRAFT QUALITY STEELS* from

Acme-Newport

**Plate, sheet and strip in alloy and carbon grades*

Acme-Newport's metallurgically accurate steels provide the uniformity and dependability demanded for American defense weapons. This 71-year-old mill rolls aircraft quality alloy and carbon steels in plate, sheet and strip, including the highly important chrome-molybdenum AISI 4130 type. Always to exact specification and with proper response to heat treatment, these steels fill prime and subcontractors' need for top quality in vital plane parts, guided missiles and Jatos. Proof that Acme-Newport's long experience, exacting controls, and modern facilities and methods are geared to the requirements of both defense and industry.

Acme-Newport Steel COMPANY

NEWPORT, KENTUCKY

A SUBSIDIARY OF ACME STEEL COMPANY

Market Outlook

THE REST of this year promises more comfort than steel buyers have seen for a long time.

Steel supply, with a few exceptions, will be adequate, and prices likely will be stable.

SUPPLY—Contributing to the adequacy of steel supplies are increased capacities of the steel industry and the production continuity that is made possible by the three-year labor contract in the steel industry. Last year, a strike robbed the year of about six weeks of steel production. At the end of this month, steel output will be 6 million ingot tons ahead of what it was at the corresponding time last year.

PRICES—Price stability is likely because of several restraining influences: 1. The current Congressional investigation into steel prices. 2. The high level of steel company earnings. 3. The difficulty experienced by steel users in passing on or absorbing increased costs. 4. The covering by steel companies of part of their current cost increases through upward adjustments in extras several months ago.

Early delivery can be made on most forms of steel. Even wide flange beams and heavy plates are a little easier to get than they were.

DEMAND—While steel supplies should remain adequate, a strengthening in demand for fourth quarter delivery is looked for by buyers. This is reflected in a report prepared by the Steel Committee of the National Association of Purchasing Agents. It expects a moderately increased demand in each of the 14 categories on which it reports.

Greatest increase is expected in demand for hot rolled sheets at the mill level, with the next greatest increase in cold rolled sheets. Plates and heavy structurals, followed by oil country tubular goods, are expected to be in tighter supply-demand relation than any other steel product.

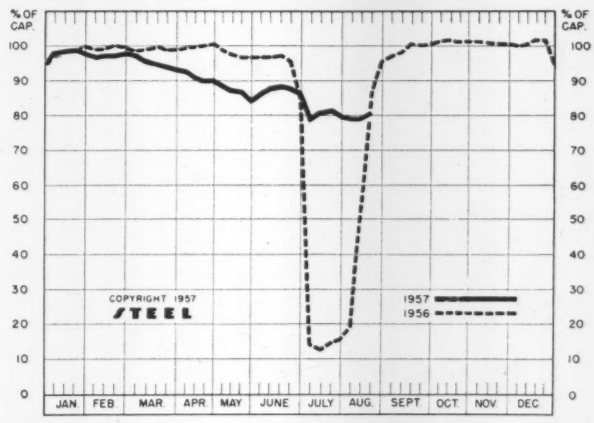
PRODUCTION—While steel mill operation is spotty, production as a whole was good enough in the week ended Aug. 18 to raise the national average of steelmaking to 80.5 per cent of capacity. The preceding week's rate was 79 per cent.

CONTRAST—In the Buffalo district, Bethlehem Steel Co.'s plant moved up to virtual capacity in ingot production, while Republic Steel Corp.'s plant in that area continues at half capacity. The Bethlehem plant's principal product is sheets. The Republic mill makes bars.

In the Cleveland area, where the steelmaking rate was 90 per cent in the week ended Aug. 18, one of the plants was running at 105.5 per cent of capacity, an increase of a couple of points over the preceding week.

PRICE TAGS—Scrap prices, in general, are steady. STEEL's price composite on steelmaking grades holds at $53.83 a gross ton. Steel prices remain steady, except for some scattered revisions. In the Philadelphia area, warehouses reduced galvanized sheets slightly more than $9 a ton. This product is one of the easiest in supply, and no substantial pickup is foreseen for the near future. Dolomite, a refractory material used by the steel industry, went up 65 to 75 cents a net ton in the East and Midwest.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Aug. 18	Change	Same Week 1956	Same Week 1955
Pittsburgh	82	0*	90	94.5
Chicago	85	0	90.5	96
Mid-Atlantic	86.5	+ 0.5	94	93.5
Youngstown	79	— 2	90	100
Wheeling	96	+ 9	96	97
Cleveland	90	+ 3*	102	100
Buffalo	95	+ 7	92.5	105
Birmingham	85.5	0	73	60
New England	48	— 1	90	87
Cincinnati	80.5	+ 7.5*	89.5	94.5
St. Louis	85.5	0	106	96
Detroit	55	+ 1*	74	87.5
Western	97	— 1	78	101
National Rate	80.5	+ 1.5	87	91

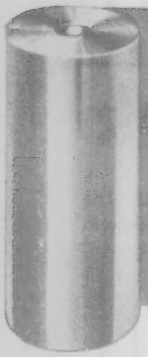
INGOT PRODUCTION‡

	Week Ended Aug. 18	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	130.5†	127.2	126.4	134.1
NET TONS (In thousands)	2,097†	2,043	2,030	2,154

*Change from preceding week's revised rate.
†Estimated. ‡Amer. Iron & Steel Institute.
Weekly capacity (net tons): 2,559,490 in 1957; 2,461,893 in 1956; 2,413,278 in 1955.

Metalworking Outlook—p. 101

Technical Outlook—p. 149



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PURE COPPER FOIL?

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"Electro-Sheet" Copper Foil

Copper is deposited, under carefully controlled conditions, onto huge rotating drums and stripped off.

GAGES. ½ oz. per sq. ft. (.0007″)
1 oz. per sq. ft. (.0014″)
2 oz. per sq. ft. (.0028″)
3 oz. per sq. ft. (.0042″)
4 oz. per sq. ft. (.0056″)
5 oz. per sq. ft. (.0070″)
6 oz. per sq. ft. (.0084″)
7 oz. per sq. ft. (.0098″)

WIDTHS. Slit to ordered widths in ½″ increments from 6″ to 62″ trimmed, or 64″ untrimmed.

LENGTH. In continuous length rolls, varying by gage. Only limiting factor is weight of full-width roll.

COMMERCIAL QUALITY. Available in the full range of gages.

PRINTED-CIRCUIT QUALITY. Quality carefully controlled to conform with N.E.M.A. Specification for copper foil. Clean, bright surface on one side relatively free from pits, scratches, nodules, and surface inclusions. The reverse side has a matte finish for high bond strength between the base material and the copper. Furnished in gages from 1 oz. per sq. ft. (.0014″) to 7 oz. per sq. ft. (.0098″) and to exceptionally close gage tolerances of ± .0003″ for 1 oz. and 2 oz., and ± .0006″ for 3, 4, 5, 6 and 7 oz. weights.

FURNACE-BRAZING QUALITY. Clean and free from surface residues. Furnished in thicknesses from 1 oz. to 7 oz. per square foot.

ELECTROSTATIC SHIELDING. To prevent leakage, in or out, of stray currents which affect the proper functioning of electrical equipment—transformers, radio and TV receiving sets, electrodiathermy equipment — broadcasting buildings, hospital operating rooms, X-ray rooms.

DAMP-PROOFING AND VAPOR SEAL. "Electro-Sheet" is available bonded to high-grade building paper, cloth, or asphaltic compounds —strong, flexible, easy to handle—an economical solution to many varied problems of water-, moisture-, vapor-, and wind-proofing.

GASKETS. "Electro-Sheet" bonded to paper, fabric, or compounds.

CAPPING. For such things as utility poles and fencing to prevent moisture from entering open end pores of wood, causing rot.

CABLE WRAPPING. Bonded to paper or fabric, and corrugated to conform to spiral winding without rupture.

REFLECTOR SURFACE. To reflect both heat and light.

DECORATION. "Electro-Sheet" is easily bonded to plywood, paper, cardboard, plastics for decorative effects in products, displays, advertising. It takes printing or silk screening.

PRINTED CIRCUITS. Rigidly controlled quality "Electro-Sheet" for the exacting use of fabricating electric circuit wiring by the printing-etching method and by die stamping.

FURNACE BRAZING. For bonding of various metals together by furnace brazing in a reducing atmosphere.

"Electro-Sheet" Copper Foil was developed by Anaconda to provide the positive and durable protection of copper at low cost. It is nonrusting, vermin-proof, nonflammable and impervious to penetration by water, air, or moisture. For detailed information or help in application to your products write: The Ansonia Division, The American Brass Company, Ansonia, Conn. 5752

ANACONDA®

"ELECTRO-SHEET" COPPER FOIL

SOLD BY THE AMERICAN BRASS COMPANY

STEEL MILL SHIPMENTS—1st Half 1957

MARKET GROUPS

	Net Tons	Per Cent of Total Shipments
Warehouses	8,358,182	18.87
Automotive	7,250,605	16.37
Construction	6,527,669	14.74
Containers	3,728,387	8.42
Machinery	2,642,848	5.97
Export	2,536,093	5.73
Rail Transportation	2,504,434	5.66
Converters	1,972,499	4.45
Contractors' Products	1,926,723	4.35
Electrical Machinery	1,164,489	2.63
Domestic, Commercial Equip.	1,022,433	2.31
Appliances, Utensils, Cutlery	827,954	1.87
Forgings	642,611	1.45
Fasteners	618,322	1.40
Shipbuilding	590,327	1.33
Agricultural	584,753	1.32
Unclassified	469,947	1.06
Oil & Gas Drilling	431,272	0.97
Ordnance & Other Military	226,815	0.51
Mining, Quarrying, Lumbering	193,298	0.44
Aircraft	65,774	0.15
Total	44,285,435	100.00

PRODUCTS

	Net Tons	Per Cent of Total Shipments
Cold Rolled Sheets	6,126,934	13.84
Plates	5,085,011	11.48
Hot Rolled Sheets	4,382,177	9.90
Hot Rolled Bars	4,344,641	9.81
Structural Shapes	3,442,940	7.77
Electrolytic Tin Plate	2,783,280	6.28
Semifinished	2,423,271	5.47
Line Pipe	2,179,580	4.92
Oil Country Tubular Goods	1,584,909	3.58
Standard Pipe	1,517,783	3.43
Drawn Wire	1,448,563	3.27
Rails & Accessories	1,361,485	3.07
Reinforcing Bars	1,334,299	3.01
Galvanized Sheets	1,292,027	2.92
Hot Rolled Strip	789,338	1.78
Cold Finished Bars	747,234	1.69
Cold Rolled Strip	632,873	1.43
Mechanical Tubing	447,106	1.01
Electrical Sheets & Strip	359,538	0.81
Pressure Tubing	239,057	0.54
Tool Steel	56,083	0.13
All Other	1,707,306	3.86
Total	44,285,435	100.00

Steel Product Mix Undergoes Change

Plate shipments move up to second place—not far behind cold rolled sheets in first half. Construction industry tightens hold on third place as a market for mills

STEEL DISTRIBUTION has undergone a change in product mix. This is revealed by a report from the American Iron & Steel Institute, New York.

In the first half of 1957, plates moved up to second largest product, and were not far behind the tonnage of the top product—cold rolled sheets. For 1956 as a whole, plates ranked fourth, and comprised only a little over half as much tonnage as cold rolled sheets.

Hot rolled sheets and hot rolled bars exchanged positions. The former moved up into third place and the latter slipped into fourth spot in the first half of 1957.

Structural shapes continued to hold fifth place.

(How the products ranked, and who got the steel and how much in the first half are shown in the above table compiled from the AISI report.)

Warehouses continue to be the No. 1 customer of the steel mills. While the automotive industry is still the No. 2 customer, it is the No. 1 consumer (warehouses are not consumers; they are distributors). The construction industry not only continues to be the third largest outlet for mill shipments of steel, but it strengthened its hold on this position. In the first half, the construction industry received 14.74 per cent of mill shipments of steel, compared with 12.54 per cent in all of 1956.

Improved supply of steel in this country and the strong demand from abroad are reflected in the jump of steel exports from ninth place to sixth. In all of 1956, exports took 4.35 per cent of mill shipments. In the first half of 1957, they took 5.73 per cent.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 245 & 246

Orders for both hot rolled and cold finished sheets are now streaming into sales offices from automakers for September delivery, a major producer in the Pittsburgh district comments. Steel ordered for September will go into cars to be produced in October. At that time, automakers should be in large volume production of 1958 models.

Currently, August volume is not much larger than that for July which was larger than had been expected. Sales managers, therefore, are not disappointed with this month's production. Numerous consumers of flat rolled steel, although low on inventory, are not increasing specifications to the extent expected. One major reason for the lack of buying interest is the availability of material for prompt shipment and the prospect for ample supplies in weeks ahead.

Although demand for sheets and strip probably will rise steadily in September and October, a major supplier predicts that its mills will not operate at more than 80 to 85 per cent of capacity in the fourth quarter. Reasons for the conservative prediction are lack of large orders from appliance manufacturers and slow sales of galvanized and silicon sheets. Grain oriented silicon sheet demand is firm, but demand has caught up with supply for the first time in several years.

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Reinforcing Bars . . .

Reinforcing Bar Prices, Page 244

Demand for reinforcing bars remains active with some buyers requesting prompt shipment. Producers are increasing production steadily and no widespread shortage is expected.

On the West Coast, producers' order backlogs are declining as recent awards have been in small lots, generally under 100 tons each. No sizable projects are up for figures.

Steel Bars . . .

Bar Prices, Page 244

Order volume in the cold drawn bar market is slightly heavier. Competition is keen and quick deliveries are essential. Converters in New England are well stocked with hot rolled material, but are buying all the hot rolled leaded bars available for delivery within four or five weeks. At least one converter in the Philadelphia district is operating several points above the national average.

The outlook among suppliers of hot rolled bars is slightly more encouraging, although sales volume this month has not increased as much as had been expected. One Pittsburgh producer says that August sales will be 4 to 5 per cent larger than those in July, but much of the increase is credited to the resumption of operations at some consuming plants following shutdowns for vacations.

Consumers' inventories are dwindling and the return of automakers to the market on an active basis should swell the September sales volume. Some blueprints on 1958 models are appearing for preliminary runs. This has stimulated interest, especially in alloy bars.

In some instances, producers are

booked through September on heavy carbon flats.

For the second time in the last 90 days, Connors Steel Div., H. K. Porter Company Inc., Birmingham, has added to its size range of cold drawn rounds. The company now produces cold drawn rounds ranging from 0.5 in. to 4.5 in. in diameter.

Wire . . .

Wire Prices, Pages 246 & 247

Wire orders this month have not increased to expected levels. Bookings for September are heavier, but many users are postponing purchases until after Labor Day. Inventories of finished wire are low in many instances, but have been reduced at a slower rate than had been anticipated by some consuming industries, notably fastener and furniture spring producers. Resumption of automotive demand is expected within the next month and this likely will spark a general improvement in the market.

Tubular Goods . . .

Tubular Goods Prices, Page 248

Suppliers of merchant pipe are disappointed in the lack of any substantial increase in sales so far this month. Bookings of seamless and welded pipe are light, at about the same level as in July.

Oil country tubing continues to be a bright spot in the market. Most producers had a carryover of unfilled orders this month, but they have too many new orders to permit a reduction in the order backlog this quarter. Carryover of unfilled orders into the fourth quarter will help keep operations at capacity during that period. Producers note that many of the unfilled requests consist of orders for specialty products, which are in urgent demand.

Distributors' stocks of tubular goods are in better balance in New England. Supply is short only in seamless 12 in. and larger. In sizes up to 10 in., supplies of seamless and electricweld pipe have improved. Most consumers in the district are not taking their full quotas on buttweld pipe and stainless tubing.

El Paso Natural Gas Co. will build a 500-mile pipeline from Twin Falls, Idaho, to a point south of Las Vegas, Nev.

Plates . . .

Plate Prices, Page 244

Plate producers are booked well through October and are accepting orders for delivery beyond that period on wide, heavy-gage material. Universal and strip mill openings for third quarter are narrowing, but quality grades in lighter gages are no easier. Little or no tonnage in this category is rolled on strip mills. Some strip mills will roll plates during the balance of this year.

Scarcity of heavy plates continues to delay some construction work, as well as fabrication of line pipe. Some industries, such as railroad equipment, have been able to use light plates from strip mills. One eastern oil refinery will cut back buying for the fourth quarter, but this is an isolated case.

Heavy and wide plates will be no easier to obtain in the fourth quarter, despite some capacity increases. A major purchaser says

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quotas of heavy plates are no higher in August and September and may drop in the fourth quarter due to maintenance requirements and heavy shipbuilding needs.

One major supplier in the Pittsburgh district is nearly two months behind on delivery promises, because of a mill slowdown and the adverse effect of the recent hot weather on operations.

Stainless Steel . . .

Stainless Steel Prices, Page 248

Production of stainless and heat resisting steel ingots during the second quarter totaled 249,470 net tons (all types), reports the American Iron & Steel Institute. This was off from the 323,003 tons produced in the first quarter and was down from the 300,957 produced in the second quarter of last year.

Output for the first six months this year was 572,473 net tons, which compares with 614,291 tons in the like period of 1956.

Structural Shapes . . .

Structural Shape Prices, Page 244

Although fabricating shops are taking all the wide flange tonnage offered, some easing in the tight market is noted. Fabricators are getting all the lighter structural tonnage needed.

New orders for construction work have leveled off this month after a rapid increase in June and July. Construction firms will have difficulty obtaining enough structural beams to complete their work on schedule. They expect to fill all commitments, however, with the help of structurals obtained from warehouses and other sources.

Firms depending on mills for delivery of wide flange beams will find their stocks declining this month and in September. Deliveries are six to eight weeks behind schedule and are steadily falling further behind because of hot weather and maintenance requirements in mills.

Supply of angles and channels is much better. Users have no trouble obtaining sufficient supplies on a prompt delivery basis.

Bookings by Boston area fabricating shops have been cut drastically by strikes; work in progress has been set back at least one

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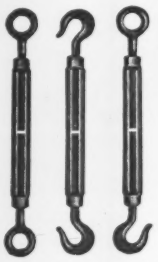

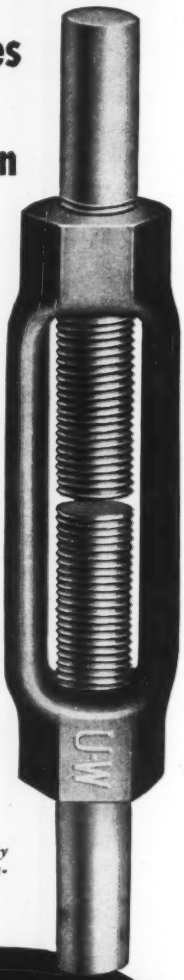

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month. Striking building trade workers have brought construction in Los Angeles to a virtual halt.

Warehouse . . .

Warehouse Prices, Page 249

Some disappointment is discernible among distributors, as sales so far this month have not risen above the July level. Plates and structurals are the only products in strong demand.

Most construction companies must supplement their regular allocations from mills with purchases of wide plates and wide flange beams from warehouses.

Sheets and strip continue to move slowly, although most fabricators have ended their vacations and have resumed normal operations.

Distributors complain that most users continue to resist the higher prices posted recently. Rumors of price cutting in flat rolled products are widespread. Distributors in the Philadelphia district have reduced prices slightly more than $9 a ton on galvanized sheets.

Tin plate sales have declined in the past month. Only a large increase in automotive buying could revive the flat rolled warehouse market, many distributors say.

Industrial Rubber Prices Up

B. F. Goodrich Industrial Products Co., Akron, raised selling prices 2 to 3 per cent on belting, 3 to 4.5 per cent on hose and 3 to 5 per cent on special industrial products. The increases, effective Aug. 5, were attributed to increases in wages and costs for materials and transportation.

Canada . . .

Toronto—Foreign trade in iron and steel is heavier this year than it was a year ago. Imports of primary forms in the first four months totaled 827,169 net tons, compared with 644,366 tons in the like 1956 period. Exports during the first four months of this year amounted to 151,567 tons, compared with 93,198 tons a year ago.

Production of primary iron and steel products in Canada amounted to 470,224 net tons in April, compared with 527,536 tons in March of this year and 511,802 tons in April, 1956.

Atom smasher builder

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AVERY AND SAUL COMPANY, pressure vessel and steel fabricator of Cambridge, Mass., builds electron accelerator tanks for Van de Graaff atom smashers. The ⅞" A-212 Grade B carbon steel (70,000 psi) used in these tanks must be completely clean—free of surface imperfections and scale, and ground to a 125 micro-inch surface. To do this important clean-up job, the company uses coated abrasive discs on air grinders and has experimented with the major brands of discs on the market today.

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Steel Output Sets Record

Steel production in the first seven months of this year was greater than output in any identical previous period, reports the American Iron & Steel Institute. The seven-month total was 69,479,547 net tons. The largest previous figure was 66,307,248 tons for the first seven months of 1955.

During the seven months, steelmaking furnaces operated at an average of 89.6 per cent of their rated capacity (133,459,150 net tons annually as of last Jan. 1). In 1955, when the previous record seven-month period was chalked up, the industry had to operate at about 95 per cent of its then rated capacity to make the equivalent amount of steel.

During July, steel production amounted to 8,896,000 net tons. This compared with 9,391,402 in June, the decline being attributable to vacation schedules and production losses over the Fourth of July holiday. Last year, production of steel in July was only 1,622,163 tons and the seven-month total was 64,229,000 tons. Output then was held down by the steel strike.

Last month, the steel furnace operations averaged 78.5 per cent of rated capacity. This compares with 85.6 in June.

Steel Ingot Production—July, 1957

Period	— OPEN HEARTH— Net tons	Per cent of capacity	—BESSEMER— Net tons	Per cent of capacity	—ELECTRIC— Net tons	Per cent of capacity	—TOTAL— Net tons	Per cent of capacity
1957								
January ..	9,829,691	99.0	294,839	77.1	884,232	86.5	11,008,762	97.1
February .	8,898,671	99.2	277,682	80.4	810,853	87.8	9,987,206	97.6
March	9,442,164	95.1	275,156	71.9	871,754	85.2	10,589,074	93.4
1st Qtr. ..	28,170,526	97.7	847,677	76.3	2,566,839	86.4	31,585,042	96.0
April	8,820,328	91.8	231,731	62.6	762,721	77.1	9,814,780	89.5
May	8,842,707	89.1	201,864	52.8	747,752	73.1	9,792,323	86.4
*June	8,498,903	88.4	210,915	57.0	681,584	68.9	9,391,402	85.6
*2nd Qtr. .	26,161,938	89.8	644,510	57.4	2,192,057	73.0	28,998,505	87.2
*1st 6 Mo.	54,332,464	93.7	1,492,187	66.8	4,758,896	79.7	60,583,547	91.5
†July	8,077,000	81.3	195,000	51.0	624,000	61.0	8,896,000	78.5
1956								
January ..	9,676,151	101.4	323,235	79.5	828,845	86.7	10,828,231	99.3
February .	9,043,064	101.3	296,543	78.0	799,388	87.1	10,118,995	99.2
March	9,795,263	102.7	310,060	76.3	819,465	85.7	10,924,788	100.2
1st Qtr. ..	28,514,478	101.8	929,838	77.9	2,427,698	86.5	31,872,014	99.6
April	9,437,945	102.2	306,388	77.9	779,452	84.2	10,523,785	99.7
May	9,370,167	98.2	297,990	73.3	822,219	86.0	10,490,376	96.2
June	8,664,605	93.9	282,846	71.9	773,546	83.6	9,720,997	92.1
2nd Qtr. ..	27,472,717	98.1	887,224	74.3	2,375,217	84.6	30,735,158	96.0
1st 6 Mo. .	55,987,195	100.0	1,817,062	76.1	4,802,915	85.6	62,607,172	97.8
July	1,330,151	13.9	.....	....	292,012	30.5	1,622,163	14.9
August ...	7,213,274	75.6	189,564	46.6	719,759	75.3	8,122,597	74.5
September..	9,342,796	101.2	286,978	72.9	792,885	85.7	10,422,659	98.8
3rd Qtr. ..	17,886,221	63.2	476,542	39.5	1,804,656	63.6	20,167,419	62.3
9 Mo.	73,873,416	87.6	2,293,604	63.8	6,607,571	78.2	82,774,591	85.9
October ...	9,841,002	103.2	330,101	81.2	877,410	91.8	11,048,513	101.3
November .	9,430,248	102.2	295,827	75.2	829,425	89.6	10,555,500	100.0
December .	9,695,919	101.6	308,465	75.9	833,161	87.1	10,837,545	99.4
4th Qtr. ..	28,967,169	102.3	934,393	77.4	2,539,996	89.5	32,441,558	100.3
2nd 6 Mo..	46,853,390	82.8	1,410,935	58.5	4,344,652	76.5	52,608,977	81.3
Total 1956	102,840,585	91.6	3,227,997	67.4	9,147,567	81.2	115,216,149	89.8

Note—The percentages of capacity operated in 1957 are calculated on Jan. 1, 1957, annual capacities of: Open hearth, 116,912,410 net tons; bessemer, 4,505,000 net tons; electric, 12,041,740 net tons; total, 133,459,150 net tons. The percentages of capacity operated in 1956 are calculated on Jan. 1, 1956, annual capacities of: Open hearth, 112,317,040 net tons; bessemer, 4,787,000 net tons; electric, 11,259,050 net tons; total, 128,363,090 net tons.
*Revised. †Preliminary figures, subject to revision.

Semifinished Steel . . .

Semifinished Prices, Page 244

Youngstown Sheet & Tube Co., Youngstown, has produced its 120 millionth ton of steel. The historic ton was part of a 15,000-lb ingot rolled Aug. 8 on its Campbell Works blooming mill and subsequently on its hot strip mill.

Inland Steel Co. tapped the first heat from the first of three new 320-ton open hearths at its Indiana Harbor (Ind.) Works on Aug. 6 (see STEEL, Aug. 5, p. 141).

Inland also marked a half-century operation of its Madeline (No. 1) blast furnace on Aug. 12. When this furnace was lighted in 1907, Inland emerged as an integrated steel company. Not only was it Inland's first blast furnace, but it was the first in Indiana and the first built by Arthur G. McKee & Co., Cleveland.

Ships First Vacuum Steel

Midvale-Heppenstall Co., Philadelphia, shipped the first steel billets it has produced by the vacuum arc (consumable electrode) process. Midvale-Heppenstall is one of two score companies in the vacuum melted alloys business (see STEEL, July 22, p. 137).

Imported Steel

Prices per 100 lbs. (except where otherwise noted) landed, including customs duty, but no other taxes.

	Atlantic & Gulf Coast	West Coast	Vancouver	Montreal
Deformed Bars (⅜" Dia. incl. all extras)	$6.78	$7.01	$6.76	$6.44
Merchant Bars (¼" Round incl. all extras)...	7.62	7.85	7.48	7.22
Bands (1"x⅛"x20' incl. all extras)	7.76	7.98	7.65	7.38
Angles (2"x2"x¼" incl. all extras)	6.57	6.75	6.99	6.69
Beams & Channels (base)	6.82	7.00	7.24	6.94
Furring Channels (C.R. ¾", per 1000')	26.62	27.77	....	....
Barbed Wire (per 82 lb. net reel)	6.95	7.40	7.75	7.80
Nails (bright, common, 20d and heavier)	8.38	8.58	9.07	8.99
Larssen Sheet Piling (section II, new, incl. size extra)	7.80	8.10	8.10	7.80
Wire, Manufacturer's, bright, low C, (11½ga.)	7.38	7.52	8.52	8.52
Wire, galvanized, low C, (11½ ga.)	8.01	8.15	9.42	9.42
Wire, Merchant quality, bl. ann., (10 ga.)...	7.60	7.75	8.78	8.78
Rope Wire (.045", 247,000 PSI, incl. extras)..	13.60	13.75	13.00	13.00
Wire, fine and weaving, low C, (20 ga.)	10.66	10.80	10.17	12.17
Tie Wire, autom. baler (14G, 97 lbs. net)....	9.58	9.73	9.64	9.54
Merchant Pipe (½" galv. T & C, per 100')...	8.48	8.83	....	....
Casing (5½", 15.5 J55, T & C, per 100')	194.00	199.00	....	....
Tubing (2⅞", 6.4 J55, EUE, per 100')	103.00	104.00	....	....
Forged R Turn. Bars, C-1035 (from 10" di.).	14.00	14.23	14.00	13.74

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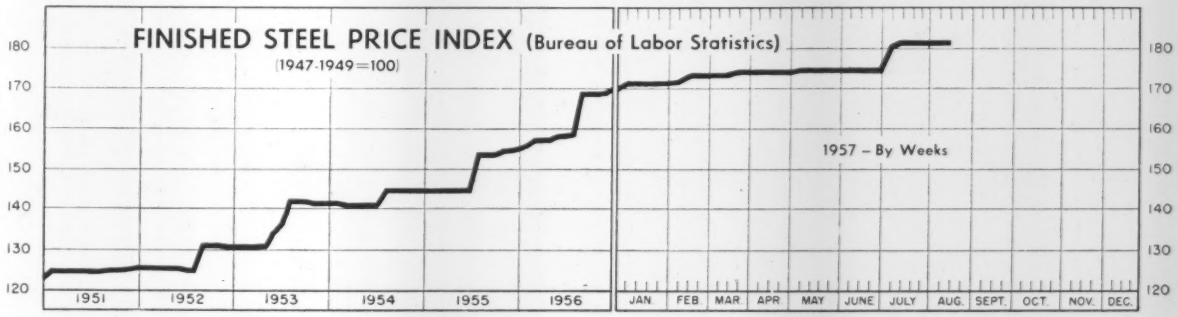

Aug. 13, 1957	Week Ago	Month Ago	July Avg.	Year Ago
181.5	181.5	181.5	181.5	168.6

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Aug. 13

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard, No. 1	$5.600	Bars, Reinforcing	6.210
Rails, Light, 40 lb	7.067	Bars, C.F., Carbon	10.360
Tie Plates	6.600	Bars, C.F., Alloy	13.875
Axles, Railway	9.825	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	60.00	Sheets, H.R., Carbon	6.192
Plates, Carbon	6.150	Sheets, C.R., Carbon	7.089
Structural Shapes	5.942	Sheets, Galvanized	8.220
Bars, Tool Steel, Carbon (lb)	0.480	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.585	Sheets, Electrical	12.108
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.274	Strip, C.R., Carbon	9.193
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.769	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.525	Strip, H.R., Carbon	6.245
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	19.814
Bars, H.R., Carbon	6.425	Pipe, Galv., Buttweld (100 ft)	23.264
		Pipe, Line (100 ft)	199.023
		Casing, Oil Well, Carbon (100 ft)	194.499
		Casing, Oil Well, Alloy (100 ft)	304.610
Tubes, Boiler (100 ft)	49.130	Black Plate, Canmaking Quality (95 lb base box)	7.583
Tubing, Mechanical, Carbon (100 ft)	24.953	Wire, Drawn, Carbon	10.225
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608	Wire, Drawn, Stainless, 430 (lb)	0.653
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783	Bale Ties (bundle)	7.967
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483	Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Aug. 14 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	239.15	239.15	239.15	225.71	181.40
Index in cents per lb	6.479	6.479	6.479	6.114	4.914

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT	$146.19	$146.19	$146.19	$137.59	$113.23
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.27	62.63	52.54
Basic Pig Iron, GT	65.99	65.99	65.68	62.18	52.16
Malleable Pig Iron, GT	67.27	67.27	67.06	63.41	53.27
Steelmaking Scrap, GT	53.83	53.83	54.33	56.67	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Aug. 14 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.425	5.425	5.425	5.075	3.95
Bars, H.R., Chicago	5.425	5.425	5.425	5.075	3.95
Bars, H.R., deld., Philadelphia	5.715	5.715	5.715	4.93	4.502
Bars, C.F., Pittsburgh	7.30*	7.30*	7.30*	6.85*	4.925
Shapes, Std., Pittsburgh	5.275	5.275	5.275	5.00	3.85
Shapes, Std., Chicago	5.275	5.275	5.275	5.00	3.85
Shapes, deld., Philadelphia	5.585	5.585	5.585	5.00	4.13
Plates, Pittsburgh	5.10	5.10	5.10	4.85	3.90
Plates, Chicago	5.10	5.10	5.10	4.85	3.90
Plates, Coatesville, Pa.	5.50	5.50	5.50	5.25	4.35
Plates, Sparrows Point, Md.	5.10	5.10	5.10	4.85	3.90
Plates, Claymont, Del.	5.70	5.70	5.70	5.35	4.35
Sheets, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.775
Sheets, H.R., Chicago	4.925	4.925	4.925	4.675	3.775
Sheets, C.R., Pittsburgh	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Chicago	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Detroit	6.05-6.15	6.05-6.15	6.05-6.15	5.325-5.425	4.775
Sheets, Galv., Pittsburgh	6.60	6.60	6.60	6.30	5.075
Strip, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.75-4.00
Strip, H.R., Chicago	4.925	4.925	4.925	4.675	3.725
Strip, C.R., Pittsburgh	7.15	7.15	7.15	6.85	5.10-5.80
Strip, C.R., Chicago	7.15	7.15	7.15	6.85	5.35
Strip, C.R., Detroit	7.25	7.25	7.25	6.35-6.95	5.30-5.60
Wire, Basic, Pittsburgh	7.65	7.65	7.65	7.20	4.85-5.225
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.35	5.90-6.35
Tin plate (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$9.85	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$96.00	$96.00	$96.00	$91.50	$70.50
Wire rods, 7/32-5/8" Pitts.	6.15	6.15	6.15	5.80	4.325

PIG IRON, Gross Ton	Aug. 14 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$63.50	$53.00
Basic, Valley	67.00	64.50	64.50	62.50	52.00
Basic, deld., Phila.	69.88	69.88	69.88	66.26	56.75
No. 2 Fdry, NevilleIsland, Pa.	66.50	66.50	66.50	63.00	52.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	63.00	52.50
No. 2 Fdry, deld., Phila.	70.38	70.38	70.38	66.76	57.25
No. 2 Fdry, Birm.	62.50	62.50	62.50	59.00	48.88
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	66.70	56.43
Malleable, Valley	66.50	66.50	65.00	63.00	52.50
Malleable, Chicago	66.50	66.50	66.50	63.00	52.50
Ferromanganese, Duquesne	255.00†	255.00†	255.00†	215.00†	228.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$55.50	$55.50	$55.50	$54.00	$44.00
No. 1 Heavy Melt, E. Pa.	52.00	52.00	54.50	57.00	42.50
No. 1 Heavy Melt, Chicago	54.00	54.00	53.00	59.00	42.50
No. 1 Heavy Melt, Valley	55.50	55.50	54.50	64.50	44.00
No. 1 Heavy Melt, Cleve.	52.50	52.50	51.50	62.00	43.00
No. 1 Heavy Melt, Buffalo	49.50	46.50	46.50	54.50	43.00
Rails, Rerolling, Chicago	76.50	79.50	76.50	80.50	52.50
No. 1 Cast, Chicago	47.50	47.50	47.50	53.50	48.50

COKE, Net Ton					
Beehive, Furn., Connisvl.	$15.25	$15.25	$15.25	$14.50	$14.75
Beehive, Fdry., Connisvl.	18.25	18.25	18.25	17.50	17.00

Steel Prices

Mill prices as reported to STEEL, Aug. 14, cents per pound exexcept as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 245; to footnotes, page 247.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 .....$73.50

INGOTS, Alloy (NT)

Detroit S41 .....$77.00
Farrell,Pa. S3 .....77.00
Lowellville,O. S3 .....77.00
Midland,Pa. C18 .....77.00
Munhall,Pa. U5 .....77.00
Sharon,Pa. S3 .....77.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)

Bessemer,Pa. U5 ....$77.50
Bridgeport,Conn. N19 ..80.50
Buffalo R2 .....77.50
Clairton,Pa. U5 .....77.50
Ensley,Ala. T2 .....77.50
Fairfield,Ala. T2 .....77.50
Fontana,Calif. K1 ....88.00
Gary,Ind. U5 .....77.50
Johnstown,Pa. B2 ....77.50
Lackawanna,N.Y. B2 ..77.50
Munhall,Pa. U5 .....77.50
S.Chicago,Ill. R2, U5 ..77.50
S.Duquesne,Pa. U5 ....77.50
Sterling,Ill. N15 .....77.50
Youngstown R2 .....77.50

Carbon, Forging (NT)

Bessemer,Pa. U5 ....$96.00
Bridgeport,Conn. N19 ..101.00
Buffalo R2 .....96.00
Canton,O. R2 .....98.50
Clairton,Pa. U5 .....96.00
Conshohocken,Pa. A3 ..101.00
Ensley,Ala. T2 .....96.00
Fairfield,Ala. T2 .....96.00
Fontana,Calif. K1 ....105.50
Gary,Ind. U5 .....96.00
Geneva,Utah C11 .....96.00
Houston S5 .....101.00
Johnstown,Pa. B2 ....96.00
Lackawanna,N.Y. B2 ..96.00
LosAngeles B3 .....105.50
Midland,Pa. C18 .....96.00
Munhall,Pa. U5 .....96.00
Seattle B3 .....109.50
Sharon,Pa. S3 .....96.00
S.Chicago R2,U5,W14 ..96.00
S.Duquesne,Pa. U5 ....96.00
S.SanFrancisco B3 ....105.50
Warren,O. C17 .....96.00

Alloy, Forging (NT)

Bethlehem,Pa. B2 ...$114.00
Bridgeport,Conn. N19 .114.00
Buffalo R2 .....114.00
Canton,O. R2, T7 ....114.00
Conshohocken,Pa. A3 .121.00
Detroit S41 .....114.00
Farrell,Pa. S3 .....114.00
Fontana,Calif. K1 ....135.00
Gary,Ind. U5 .....114.00
Houston S5 .....119.00
Ind.Harbor,Ind. Y1 ...114.00
Johnstown,Pa. B2 ....114.00
Lackawanna,N.Y. B2 .114.00
LosAngeles B3 .....134.00
Lowellville,O. S3 ....114.00
Massillon,O. R2 .....114.00
Midland,Pa. C18 .....114.00
Munhall,Pa. U5 .....114.00
Sharon,Pa. S3 .....114.00
S.Chicago R2,U5,W14 .114.00
S.Duquesne,Pa. U5 ....114.00
Struthers,O. Y1 .....114.00
Warren,O. C17 .....114.00

ROUNDS, SEAMLESS TUBE (NT)

Bridgeport,Conn. N19 $122.50
Buffalo R2 .....117.50
Canton,O. R2 .....120.00
Cleveland,O. R2 ....117.50
Gary,Ind. U5 .....117.50
S.Chicago,Ill. R2, W14 117.50
S.Duquesne,Pa. U5 ..117.50
Warren,O. C17 .....117.50

SKELP

Aliquippa,Pa. J5 ....5.075
Munhall,Pa. U5 .....4.875
Warren,O. R2 .....4.875
Youngstown R2, U5 ..4.875

WIRE RODS

AlabamaCity,Ala. R2 ..6.15
Aliquippa,Pa. J5 .....6.15
Alton,Ill. L1 .....6.35
Buffalo W12 .....6.15
Cleveland A7 .....6.15
Donora,Pa. A7 .....6.15
Fairfield,Ala. T2 .....6.15
Houston S5 .....6.40
IndianaHarbor,Ind. Y1 ..6.15
Johnstown,Pa. B2 ....6.15
Joliet,Ill. A7 .....6.15
KansasCity,Mo. S5 ....6.40
Kokomo,Ind. C16 .....6.25
LosAngeles B3 .....6.95
Minnequa,Colo. C10 ...6.40
Monessen,Pa. P17 .....6.15
N.Tonawanda,N.Y. B11..6.15
Pittsburg,Calif. C11 ....6.95
Portsmouth,O. P12 .....6.15
Roebling,N.J. R5 .....6.25
S.Chicago,Ill. R2 .....6.15
SparrowsPoint,Md. B2 ..6.25
Sterling,Ill.(1) N15 ...6.15
Sterling,Ill. N15 .....6.25
Struthers,O. Y1 .....6.15
Worcester,Mass. A7 ...6.45

STRUCTURALS

Carbon Steel Std. Shapes

Ala.City,Ala. R2 ....5.275
Atlanta A11 .....5.475
Aliquippa,Pa. J5 .....5.275
Bessemer,Ala. T2 .....5.275
Bethlehem,Pa. B2 .....5.325
Birmingham C15 .....5.275
Clairton,Pa. U5 .....5.275
Fairfield,Ala. T2 .....5.275
Fontana,Calif. K1 ....6.025
Gary,Ind. U5 .....5.275
Geneva,Utah C11 .....5.275
Houston S5 .....5.375
Ind.Harbor,Ind. I-2 ..5.275
Johnstown,Pa. B2 ....5.325
Joliet,Ill. P22 .....5.275
KansasCity,Mo. S5 ....5.375
Lackawanna,N.Y. B2..5.325
LosAngeles B3 .....5.975
Minnequa,Colo. C10 ...5.575
Munhall,Pa. U5 .....5.275
Niles,Calif. P1 .....5.925
Phoenixville,Pa. P4 ....5.50
Portland,Oreg. O4 ....6.025
Seattle B3 .....6.025
S.Chicago,Ill. U5, W14 5.275
S.SanFrancisco B3 ....5.925
Sterling,Ill. N15 .....5.275
Torrance,Calif. C11 ....5.975
Weirton,W.Va. W6 ....5.275

Wide Flange

Bethlehem,Pa. B2 ....5.325
Clairton,Pa. U5 .....5.275
Fontana,Calif. K1 ....6.225
IndianaHarbor,Ind. I-2 5.525
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 .....5.275
Phoenixville,Pa. P4 ....5.50
S.Chicago,Ill. U5 .....5.275

Alloy Std. Shapes

Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.65
Munhall,Pa. U5 .....6.55
S.Chicago,Ill. U5 .....6.55

H.S., L.A. Std. Shapes

Aliquippa,Pa. J5 .....7.75
Bessemer,Ala. T2 .....7.75
Bethlehem,Pa. B2 .....7.80
Clairton,Pa. U5 .....7.75
Fairfield,Ala. T2 .....7.75
Fontana,Calif. K1 ....8.50
Gary,Ind. U5 .....7.75
Geneva,Utah C11 .....7.75
Houston S5 .....7.85
Ind.Harbor,Ind. I-2, Y1 7.75
Johnstown,Pa. B2 .....7.80
KansasCity,Mo. S5 ....7.85
Lackawanna,N.Y. B2 ..7.80
LosAngeles B3 .....8.45
Munhall,Pa. U5 .....7.75
Seattle B3 .....8.50
S.Chicago,Ill. U5, W14..7.75
S.SanFrancisco B3 ....8.40
Struthers,O. Y1 .....7.75

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 .....7.80
Lackawanna,N.Y. B2 ..7.80
Munhall,Pa. U5 .....7.75
S.Chicago,Ill. U5 .....7.75

PILING

BEARING PILES

Bethlehem,Pa. B2 ....5.325
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 .....5.275
S.Chicago,Ill. U5 .....5.275

STEEL SHEET PILING

Lackawanna,N.Y. B2 ..6.225
Munhall,Pa. U5 .....6.225
S.Chicago,Ill. U5 ....6.225

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky. (15) A10 ..5.10
Bessemer,Ala. T2 .....5.10
Clairton,Pa. U5 .....5.10
Claymont,Del. C22 ....5.70
Cleveland J5, R2 .....5.20
Coatesville,Pa. L7 ....5.50
Conshohocken,Pa. A3 ..5.20
Ecorse,Mich. G5 .....5.20
Fairfield,Ala. T2 .....5.10
Fontana,Calif.(30) K1 ..5.85
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.10
GraniteCity,Ill. G4 ....5.30
Harrisburg,Pa. P4 .....5.80
Houston S5 .....5.20
Ind.Harbor,Ind. I-2, Y1 5.10
Johnstown,Pa. B2 .....5.10
Lackawanna,N.Y. B2 ..5.10
LoneStar,Tex. L6 .....5.45
Mansfield,O. E6 .....5.10
Minnequa,Colo. C10 ....5.95
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Pittsburgh J5 .....5.10
Riverdale,Ill. A1 .....5.10
Seattle B3 .....6.00
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14 5.10
SparrowsPoint,Md. B2 ..5.10
Sterling,Ill. N15 .....5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Youngstown R2, U5, Y1..5.10

PLATES, Carbon Abras. Resist.

Claymont,Del. C22 ....7.35
Fontana,Calif. K1 ....7.50
Geneva,Utah C11 .....6.75
Johnstown,Pa. B2 .....7.00
SparrowsPoint,Md. B2 ..7.00

PLATES, Wrought Iron

Economy,Pa. B14 ....13.15

PLATES, H.S., L.A.

Aliquippa,Pa. J5 ....7.625
Bessemer,Ala. T2 .....7.625
Clairton,Pa. U5 .....7.625
Claymont,Del. C22 ....7.625
Cleveland J5, R2 .....7.625
Coatesville,Pa. L7 ....7.925
Conshohocken,Pa. A3..7.625
Ecorse,Mich. G5 .....7.725
Fairfield,Ala. T2 .....7.625
Farrell,Pa. S3 .....7.625
Fontana,Calif.(30) K1..8.375
Gary,Ind. U5 .....7.625
Geneva,Utah C11 .....7.625
Houston S5 .....7.725
Ind.Harbor,Ind. I-2, Y1 7.625
Johnstown,Pa. B2 .....7.625
Lackawanna,N.Y. B2 ..7.625
Munhall,Pa. U5 .....7.625
Pittsburgh J5 .....7.625
Seattle B3 .....8.525
Sharon,Pa. S3 .....7.625
S.Chicago,Ill. U5, W14 7.625
SparrowsPoint,Md. B2 7.625
Warren,O. R2 .....7.625
Youngstown U5 .....7.625

PLATES, Alloy

Aliquippa,Pa. J5 .....7.20
Claymont,Del. C22 ....7.20
Coatesville,Pa. L7 .....7.20
Farrell,Pa. S3 .....7.20
Fontana,Calif.(30) K1..7.95
Gary,Ind. U5 .....7.20
Houston S5 .....7.30
Ind.Harbor,Ind. Y1 ....7.20
Johnstown,Pa. B2 .....7.20
Lowellville,O. S3 .....7.20
Munhall,Pa. U5 .....7.20
Newport,Ky. A2 .....7.20
Pittsburgh J5 .....7.20
Seattle B3 .....8.10
Sharon,Pa. S3 .....7.20
S.Chicago,Ill. U5, W14 7.20
SparrowsPoint,Md. B2 .7.20
Youngstown Y1 .....7.20

FLOOR PLATES

Cleveland J5 .....6.175
Conshohocken,Pa. A3 ..6.175
Ind.Harbor,Ind. I-2 ..6.175
Munhall,Pa. U5 .....6.175
S.Chicago,Ill. U5 .....6.175

PLATES, Ingot Iron

Ashland c.l. (15) A10..5.35
Ashland l.c.l. (15) A10..5.85
Cleveland c.l. R2 .....5.85
Warren,O. c.l. R2 .....5.85

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)

Ala.City,Ala.(9) R2 ..5.425
Aliquippa,Pa.(9) J5 ....5.425
Alton,Ill. L1 .....5.625
Atlanta(9) A11 .....5.625
Bessemer,Ala.(9) T2 ..5.425
Birmingham(9) C15 ....5.425
Bridgeport,Conn.(9) N19 5.65
Buffalo(9) R2 .....5.425
Clairton,Pa.(9) U5 ....5.425
Cleveland(9) R2 .....5.425
Ecorse,Mich.(9) G5 ....5.525
Emeryville,Calif. J7 ...6.175
Fairfield,Ala.(9) T2 ..5.425
Fairless,Pa.(9) U5 ....5.575
Fontana,Calif.(9) K1 ..6.125
Gary,Ind.(9) U5 .....5.425
Houston(9) S5 .....5.675
Ind.Harbor(9) I-2, Y1 5.425
Johnstown,Pa.(9) B2 ..5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo.(9) S5 .5.675
Lackawanna(9) B2 ....5.425
LosAngeles(9) B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ..5.875
Niles,Calif. P1 .....6.125
N.T'wanda,N.Y.(46)B11 5.775
Pittsburg,Calif.(9) C11 6.125
Pittsburgh(9) J5 .....5.425
Portland,Oreg. O4 ....6.175
Seattle B3, N14 .....6.175
S.Ch'c'go(9)R2,U5,W14 5.425
S.Duquesne,Pa.(9) U5 .5.425
S.SanFran.,Calif.(9)B3 6.175
Sterling,Ill.(1)(9) N15..5.425
Sterling,Ill.(9) N15 ...5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..5.425
Torrance,Calif.(9) C11 6.125
Youngstown(9) R2, U5 5.425

BARS, H.R. Leaded Alloy (Including leaded extra)

Warren,O. C17 .....7.475

BARS, Hot-Rolled Alloy

Aliquippa,Pa. J5 .....6.475
Bethlehem,Pa. B2 ....6.475
Bridgeport,Conn. N19 ..6.55
Buffalo R2 .....6.475
Canton,O. R2, T7 ....6.475
Clairton,Pa. U5 .....6.475
Detroit S41 .....6.475
Ecorse,Mich. G5 .....6.575
Fairless,Pa. U5 .....6.625
Farrel,Pa. S3 .....6.475
Fontana,Calif. K1 ....7.525
Gary,Ind. U5 .....6.475
Houston S5 .....6.725
Ind.Harbor,Ind. I-2, Y1 6.475
Johnstown,Pa. B2 ....6.475
KansasCity,Mo. S5 ....6.725
Lackawanna,N.Y. B2 ..6.475
Lowellville,O. S3 ....6.475
LosAngeles B3 .....7.525
Massillon,O. R2 .....6.475
Midland,Pa. C18 .....6.475
Pittsburgh J5 .....6.475
Sharon,Pa. S3 .....6.475
S.Chicago R2, U5, W14 6.475
S.Duquesne,Pa. U5 ....6.475
Struthers,O. Y1 .....6.475
Warren,O. C17 .....6.475
Youngstown U5 .....6.475

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 ....7.925
Bessemer,Ala. T2 ....7.925
Bethlehem,Pa. B2 ....7.925
Bridgeport,Conn. N19 ..7.95
Clairton,Pa. U5 .....7.925
Cleveland R2 .....7.925
Ecorse,Mich. G5 .....8.025
Fairfield,Ala. T2 ....7.925
Fontana,Calif. K1 ....8.625
Gary,Ind. U5 .....7.925
Houston S5 .....8.175
Ind.Harbor,Ind. Y1 ....7.925
Johnstown,Pa. B2 ....7.925
KansasCity,Mo. S5 ....8.175
Lackawanna,N.Y. B2..7.925
LosAngeles B3 .....8.625
Pittsburgh J5 .....7.925
Seattle B3 .....8.675
S.Chicago,Ill. U5, W14 7.925
S.Duquesne,Pa. U5 ....7.925
S.SanFrancisco B3 ....8.675
Struthers,O. Y1 .....7.925
Youngstown U5 .....7.925

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa.(9) B2 ..5.575
Houston(9) S5 .....5.675
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
Sterling,Ill. N15 .....5.525
Sterling,Ill.(1) N15 ..5.425
Tonawanda,N.Y. B12 ..5.425

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 .....5.425
Atlanta A11 .....5.625
Joliet,Ill. P22 .....5.425
Niles,Calif. P1 .....6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SanFrancisco S7 .....6.275
Seattle B3 .....6.175

BAR SHAPES, Hot-Rolled Alloy

Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.80
KansasCity,Mo. S5 ....6.80
Pittsburgh J5 .....6.55
Youngstown U5 .....6.55

BARS, C.F., Leaded Alloy (Including leaded extra)

Ambridge,Pa. W18 ...9.925
BeaverFalls,Pa. M12 ..9.925
Camden,N.J. P13 ....10.10
Chicago W18 .....9.925
Cleveland C20 .....9.925
LosAngeles P2, S30 (Grade A) 11.30
(Grade B) 11.80
Monaca,Pa. S17 .....9.925
Newark,N.J. W18 ....10.10
SpringCity,Pa. K3 ....10.10
Warren,O. C17 .....9.925

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ....7.30
BeaverFalls,Pa. M12,R2 7.30
Birmingham C15 .....7.90
Bridgeport,Conn. N19 ..7.65
Buffalo B5 .....7.35
Camden,N.J. P13 .....7.75
Carnegie,Pa. C12 .....7.30
Chicago W18 .....7.30
Cleveland A7, C20 ....7.30
Detroit B5, P17 .....7.50
Detroit S41 .....7.30
Donora,Pa. A7 .....7.30
Elyria,O. W8 .....7.30
FranklinPark,Ill. N5 ..7.30
Gary,Ind. R2 .....7.30
GreenBay,Wis. F7 .....7.30
Hammond,Ind. J5, L2..7.30
Hartford,Conn. R2 .....7.80
Harvey,Ill. B5 .....7.30
LosAngeles P2, S30 ....8.75
LosAngeles R2 .....8.75
Mansfield,Mass. B5 ....7.85
Massillon,O. R2, R8 ...7.30
Midland,Pa. C18 .....7.30
Monaca,Pa. S17 .....7.30
Newark,N.J. W18 .....7.75
NewCastle,Pa.(17) B4 ..7.30
Pittsburgh J5 .....7.30
Plymouth,Mich. P5 ....7.55
Putnam,Conn. W18 ....7.85
Readville,Mass. C14 ...7.85
S.Chicago,Ill. W14 .....7.30
SpringCity,Pa. K3 .....7.75
Struthers,O. Y1 .....7.30
Warren,O. C17 .....7.30
Willimantic,Conn. J5 ...7.80
Waukegan,Ill. A7 .....7.30
Youngstown F3, Y1 ....7.30

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19..6.55

BARS, Cold-Finished Alloy

Amoridge,Pa. W18 ....8.775
BeaverFalls,Pa.M12,R2 8.775
Bethlehem,Pa. B2 .....8.775
Bridgeport,Conn. N19..8.925
Buffalo B5 .....8.775
Camden,N.J. P13 .....8.95
Canton,O. T7 .....8.775
Carnegie,Pa. C12 .....8.775
Chicago W18 .....8.775
Cleveland A7, C20 ....8.775
Detroit B5, P17 .....8.975
Detroit S41 .....8.775
Donora,Pa. A7 .....8.775
Elyria,O. W8 .....8.775
FranklinPark,Ill. N5 ..8.775
Gary,Ind. R2 .....8.775
GreenBay,Wis. F7 .....8.775
Hammond,Ind. J5, L2..8.775
Hartford,Conn. R2 .....9.075
Harvey,Ill. B5 .....8.775
Lackawanna,N.Y. B2..8.775
LosAngeles P2, S30 ..10.65
Mansfield,Mass. B5 ...9.075
Massillon,O. R2, R8 ...8.775
Midland,Pa. C18 .....8.775
Monaca,Pa. S17 .....8.775
Newark,N.J. W18 .....8.95
Plymouth,Mich. P5 ...8.975
S.Chicago W14 .....8.775
SpringCity,Pa. K3 .....8.95
Struthers,O. Y1 .....8.775
Warren,O. C17 .....8.775
Waukegan,Ill. A7 .....8.775
Worcester,Mass. A7 ...9.075
Youngstown F3, Y1 ...8.775

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....5.425
Atlanta A11 .....5.625
Birmingham C15 .....5.425
Bridgeport,Conn. N19 ...5.65
Buffalo R2 .....5.425
Cleveland R2 .....5.425
Ecorse,Mich. G5 .....5.775
Emeryville,Calif. J7 ..6.175
Fairfield,Ala. T2 .....5.425
Fairless,Pa. U5 .....5.575
Fontana,Calif. K1 ....6.125
Ft.Worth,Tex.(4)(26)T4 5.875
Gary,Ind. U5 .....5.425
Houston S5 .....5.675
Ind.Harbor,Ind. I-2,Y1 5.425
Johnstown,Pa. B2 ....5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo. S5 ....5.675
Lackawanna,N.Y. B2 ..5.425
LosAngeles B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 .....6.125
Pittsburg,Calif. C11 ...6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 .....6.175
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.175
S.Chicago,Ill. R2 .....5.425
S.Duquesne,Pa. U5 ....5.425
S.SanFrancisco B3 ....6.175
SparrowsPoint,Md. B2..5.425
Sterling,Ill.(1) N15 ...5.425
Sterling,Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..6.00
Torrance,Calif. C11 ....6.125
Youngstown R2, U5 ..5.425

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2 .....7.65
Chicago U8 .....6.91
Cleveland U8 .....6.89
Johnstown,Pa. B2 .....7.08
KansasCity,Mo. S5 .....7.35
Lackawanna,N.Y. B2 ..6.85
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.55
Philadelphia B2 .....7.38
Pittsburgh J5, U8 .....7.10
Seattle B3, N14 .....7.70
SparrowsPt.,Md. B2 ....7.08
Williamsport,Pa. S19 ..7.00

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 18.00
Economy(Staybolt)B14 .18.45

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 .5.325
ChicagoHts.(4)(44) I-2 .5.425
ChicagoHts.(4) C2 ....5.425
Ft.Worth,Tex.(26) T4..5.875
Franklin,Pa.(3) F5 ...5.325
Franklin,Pa.(4) F5 ...5.425
JerseyShore,Pa.(4) J8 ..5.30
Marion,O.(3) P11 .....5.325
Tonawanda(3) R12 ....5.325
Tonawanda(4) B12 ....6.00
Williamsport,Pa. (3)S19 5.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.925
Allenport,Pa. P7 .....4.925
Ashland,Ky.(8) A10....4.925
Cleveland J5, R2 ....4.925
Conshohocken,Pa. A3 ..4.975
Detroit(8) M1 .....5.025
Ecorse,Mich. G5 .....5.025
Fairfield,Ala. T2 ....4.925
Fairless,Pa. U5 .....4.975
Fontana,Calif. K1 ....5.775
Gary,Ind. U5 .....4.925
Geneva,Utah C11 ....5.025
Granite City,Ill.(8) G4..5.125
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 .....4.925
Lackawanna,N.Y. B2 ..4.925
Mansfield,O. E6 .....4.925
Munhall,Pa. U5 .....4.925
Newport,Ky. (8) A2 ..4.925
Niles,O. M21, S3 ....4.925
Pittsburg,Calif. C11 ..5.625
Pittsburgh J5 .....4.925
Portsmouth,O. P12 ....4.925
Riverdale,Ill. A1 .....4.925
Sharon,Pa. S3 .....4.925
S.Chicago,Ill. W14 ....4.925
SparrowsPoint,Md. B2..4.925
Steubenville,O. W10 ...4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ....4.925
Youngstown U5, Y1..4.925

SHEETS, H.R., (19 Ga. & Lighter)

Niles,O. M21 .....6.05

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 ....8.10
Irvin,Pa. U5 .....8.10
Munhall,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 ....8.10

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Cleveland J5, R2 ....7.275
Conshohocken,Pa. A3 ..7.325
Ecorse,Mich. G5 .....7.375
Fairfield,Ala. T2 ....7.275
Fairless,Pa. U5 .....7.325
Farrell,Pa. S3 .....7.275
Fontana,Calif. K1 ....8.125
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2,Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna(35) B2 ..7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....7.275
S.Chicago,Ill. U5,W14 7.275
Sharon,Pa. S3 .....7.275
SparrowsPoint(36) B2..7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 ....7.275
Youngstown U5, Y1 ..7.275

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.675
Warren,O. R2 .....5.675

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.80
Middletown,O. A10 ....6.55
Warren,O. R2 .....6.80

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....6.05
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 ..6.10
Detroit M1 .....6.05
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4 ...6.05
Fontana,Calif. K1 ....7.30
Gary,Ind. U5 .....6.05
GraniteCity,Ill. G4 .....6.25
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..6.05
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11 ....7.00
Pittsburgh J5 .....6.05
Portsmouth,O. P12 .....6.05
SparrowsPoint,Md. B2 ..6.05
Steubenville,O. W10 ....6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Yorkville,O. W10 .....6.05
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 ....8.975
Ecorse,Mich. G5 .....9.075
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 ....10.275
Gary,Ind. U5 .....8.975
IndianaHarbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Lackawanna(37) B2 ..8.975
Pittsburgh J5 .....8.975
SparrowsPoint(38) B2 8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ....8.975
Youngstown Y1 .....8.975

SHEETS, Culvert	Cu Steel	Cu Fe
Ashland,Ky. A10	.6.95	7.20
Canton,O. R2	....6.95	7.45
Fairfield T2	.....6.95	7.20
Gary,Ind. U5	....6.95	7.20
GraniteCity,Ill. G4	7.15	...
Ind.Harbor I-2	...6.95	7.20
Irvin,Pa. U5	.....6.95	7.20
Kokomo,Ind. C16	.7.05	...
MartinsFry. W10	.6.95	7.20
Pittsburgh J5	....6.95	...
Pitts.,Calif. C11	..7.70	...
SparrowsPt. B2	..6.95	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 .. 7.20

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....6.60‡
Ashland,Ky. A10 ....6.60†
Canton,O. R2 .....6.60‡
Dover,O. R1 .....6.60†
Fairfield,Ala. T2 .....6.60†
Gary,Ind. U5 .....6.60*
GraniteCity,Ill. G4 ....6.80*
Ind.Harbor,Ind. I-2 ...6.60†
Irvin,Pa. U5 .....6.60*
Kokomo,Ind. C16 .....6.70‡
MartinsFerry,O. W10 .6.60*
Middletown,O. A10 ..6.60†
Pittsburg,Calif. C11 ..7.35*
Pittsburgh J5 .....6.60†
SparrowsPt.,Md. B2 ...6.60†
Warren,O. R2 .....6.60†
Weirton,W.Va. W6 ....6.60*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.275

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 ..... 9.725
SparrowsPt.(39) B2 ...9.725

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.00
Irvin,Pa. U5 .....7.00

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.85
Middletown,O. A10 ....6.85

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.425
Niles,O.(28) R2 .....7.425
Weirton,W.Va. W6 ...7.275

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) .9.25
Butler,Pa. A10 (type 2) .9.35

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.625
Cleveland R2 .....6.625
Gary,Ind. U5 .....6.625
GraniteCity,Ill. G4 ....6.825
Ind.Harbor,Ind. I-2,Y1 6.625
Irvin,Pa. U5 .....6.625
Middletown,O. A10 ....6.625
Niles,O. M21, S3 .....6.625
Youngstown Y1 .....6.625

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ...8.65
Ind.Harbor,Ind. I-2 ...8.475
Yorkville,O. W10 .....8.475

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.00
Gary,Ind. U5 .....7.00
Mansfield,O. E6 .....7.00
Middletown,O. A10 ....7.00
Niles,O. M21, S3 .....7.00
Warren,O. R2 .....7.00
Weirton,W.Va. W6 ....7.00

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .....7.40

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Dearborn Division Sharon Steel Corp.
D4 Disston Division, H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.,
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Division, Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.
M22 Mill Strip Products Co.

N1 National Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mill
N15 Northwestern S.&.W. Co.
N19 Northeastern Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ..4.925
Allenport,Pa. P7 .....4.925
Alton,Ill. L1 .....5.125
Ashland,Ky.(8) A10 ...4.925
Atlanta A11 .....5.125
Bessemer,Ala. T2 .....4.925
Birmingham C15 .....4.925
Buffalo(27) R2 .....4.925
Conshohocken,Pa. A3 ..4.975
Detroit M1 .....5.025
Ecorse,Mich. G5 .....5.025
Fairfield,Ala. T2 .....4.925
Fontana,Calif. K1 ....5.775
Gary,Ind. U5 .....4.925
Houston S5 .....5.175
Ind.Harbor,Ind. I-2, Y1 4.925
Johnstown,Pa.(25) B2..4.925
KansasCity,Mo. S5 ....5.175
Lackaw'na,N.Y.(25) B2 4.925
LosAngeles(25) B3 ....5.675
Minnequa,Colo. C10 ...6.025
Pittsburg,Calif. C11 ..5.675
Riverdale,Ill. A1 .....4.925
SanFrancisco S7 .....6.35
Seattle(25) B3 .....6.35
Seattle N14 .....6.35
Sharon,Pa. S3 .....4.925
S.SanFrancisco(25) B3..5.675
SparrowsPoint,Md. B2..4.925
Sterling,Ill.(1) N15 ....4.925
Sterling,Ill. N15 .....5.025
Torrance,Calif. C11 ...5.675
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ....4.925
Youngstown U5 .....4.925

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 .....8.10
Farrell,Pa. S3 .....8.10
Gary,Ind. U5 .....8.10
Houston S5 .....8.35
Ind.Harbor,Ind. Y1 ....8.10
KansasCity,Mo. S5 .....8.35
LosAngeles B3 .....9.30
Lowellville,O. S3 .....8.10
Newport,Ky. A2 .....8.10
Sharon,Pa. S3 .....8.10
S.Chicago,Ill. W14 ....8.10
Youngstown U5, Y1 ....8.10

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2 .....7.325
Conshohocken,Pa. A3 ..7.325
Ecorse,Mich. G5 .....7.425
Fairfield,Ala. T2 .....7.325
Farrell,Pa. S3 .....7.325
Gary,Ind. U5 .....7.325
Houston S5 .....7.575
Ind.Harbor,Ind. I-2, Y1 7.325
KansasCity,Mo. S5 ....7.575
Lackawanna,N.Y. B2 ..7.325
LosAngeles(25) B3 ....8.075
Seattle(25) B3 .....8.325
Sharon,Pa. S3 .....7.325
S.Chicago,Ill. W14 ....7.325
S.SanFrancisco(25) B3 8.075
SparrowsPoint,Md. B2..7.325
Warren,O. R2 .....7.325
Weirton,W.Va. W6 ....7.325
Youngstown U5, Y1 ...7.325

Strip, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ..5.175
Warren,O. R2 .....5.675

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....7.15
Baltimore T6 .....7.15
Boston T6 .....7.70
Buffalo S40 .....7.15
Cleveland A7, J5 .....7.15
Conshohocken,Pa. A3 ..7.20
Dearborn,Mich. D3 ....7.25
Detroit D2, M1, P20...7.25
Dover,O. G6 .....7.15
Ecorse,Mich. G5 .....7.25
Evanston,Ill. M22 .....7.25
Follansbee,W.Va. F4 ...7.15
Fontana,Calif. K1 .....9.00
FranklinPark,Ill. T6 ...7.25
Ind.Harbor,Ind. Y1 ....7.15
Indianapolis J5 .....7.30
LosAngeles C1 .....9.20
NewBedford,Mass. R10 .7.60
NewBritain(10) S15 ....7.15
NewCastle,Pa. B4, E5 ..7.15
NewHaven,Conn. D2 ....7.60
NewKensington,Pa. A6..7.15
Pawtucket,R.I. R3 .....7.80
Pawtucket,R.I. N8 .....7.70
Philadelphia(45) P24 ...7.70
Pittsburgh J5 .....7.15
Riverdale,Ill. A1 .....7.25
Rome,N.Y.(32) R6 .....7.15
Sharon,Pa. S3 .....7.15
Trenton,N.J.(31) R5 ...8.60
Wallingford,Conn. W2 ..7.60
Warren,O. R2, T5 .....7.15
Weirton,W.Va. W6 .....7.15
Worcester,Mass. A7 ....7.70
Youngstown J5, Y1 ....7.15

STRIP, Cold-Rolled Alloy

Boston T6 .....15.40
Carnegie,Pa. S18 .....15.05
Cleveland A7 .....15.25
Dover,O. G6 .....15.05
Farrell,Pa. S3 .....15.05
FranklinPark,Ill. T6 ..15.05
Harrison,N.J. C18 ....15.05
Indianapolis J5 .....15.20
Lowellville,O. S3 .....15.05
Pawtucket,R.I. N8 ....15.40
Riverdale,Ill. A1 .....15.05
Sharon,Pa. S3 .....15.05
Worcester,Mass. A7 ...15.55
Youngstown J5 .....15.05

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7 .....10.45
Dearborn,Mich. D3 ....10.60
Dover,O. G6 .....10.45
Ecorse,Mich. G5 .....10.55
Farrell,Pa. S3 .....10.50
Ind.Harbor,Ind. Y1 ...10.65
Sharon,Pa. S3 .....10.50
Warren,O. R2 .....10.45
Weirton,W.Va. W6 ...10.45
Youngstown Y1 .....10.65

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....7.70

STRIP, C.R. Electrogalvanized

Cleveland A7 .....7.15*
Dover,O. G6 .....7.15*
Evanston,Ill. M22 .....7.25*
Riverdale,Ill. A1 .....7.25*
Warren,O. B9, T5 .....7.15*
Worcester,Mass. A7 ...7.70*
Youngstown J5 .....7.15*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3 .....7.275

TIGHT COOPERAGE HOOP

Atlanta A11 .....5.65
Riverdale,Ill. A1 .....5.50
Sharon,Pa. S3 .....5.35
Youngstown U5 .....5.35

STRIP, Cold-Finished

Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	....	....
Fostoria,O. S1	10.05	11.15	13.10	16.10	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	...	....	12.90	16.10	19.30
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
NewBritain,Conn.(10) S15	8.95	10.40	12.60	15.60	18.55
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
NewYork W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	16.10	19.30
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	... ...	18.10	21.95	26.30
Buffalo W12	... ...	18.10	....	....
Fostoria,O. S1	... ...	18.30	22.15	....
FranklinPark,Ill. T6	... ...	17.45	21.30	25.65
Harrison,N.J. C18	... ...	18.10	21.95	26.30
NewYork W3	... ...	18.10	21.95	26.30
Palmer,Mass. W12	... ...	18.10	....	....
Trenton,N.J. R5	... ...	18.10	21.95	26.30
Worcester,Mass. A7, T6	... ...	18.10	21.95	26.30
Youngstown J5	... ...	18.45	22.30	26.65

SILICON STEEL

H.R. SHEETS(22 Ga.,cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	11.80	12.90	13.95
Mansfield,O. E6	9.625	11.10	11.80	12.90	13.95
Newport,Ky. A2	9.625	11.10	11.80	12.90	13.95
Niles,O. M21, S3	9.625	11.10	11.80	12.90	....
Vandergrift,Pa. U5	....	11.10	11.80	12.90	13.95
Warren,O. R2	9.625	11.10	11.80	12.90	....
Zanesville,O. A10	....	11.10	11.80	12.90	13.95
Zanesville,O. A10 (SP coils)	....	....	11.55	12.65	13.70

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	....	12.05	13.15	14.20
GraniteCity,Ill. G4	....	9.825*11.05*	11.75*	12.85*	....
IndianaHarbor,Ind. I-2	..	9.625†10.85*	11.55*	12.65*	....
Mansfield,O. E6	....	9.625*11.35	12.05	13.50	14.20
Vandergrift,Pa. U5	....	9.625*11.35	12.05	13.15	14.20
Warren,O. R2	....	9.625*11.35	12.05	13.15	14.20
Zanesville,O. A10 (FP coils)	...	11.35	12.05	13.15	14.20

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grades T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.00	15.55	16.05	17.10
Vandergrift,Pa. U5	14.75	15.55	16.05	17.10
Zanesville,O. A10	15.00	15.55	16.05	17.10

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	17.60	19.20	19.70	20.20	....
Butler,Pa. A10	....	....	19.20	19.70	20.20	....
Vandergrift,Pa. U5	16.60	17.60	19.20	19.70	20.20	15.25**
Warren,O. R2	....	....	....	....	....	15.25‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40
ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	7.725	7.925	....
Niles,O. R2	7.725	7.925	8.125

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.05	$10.30
Fairfield,Ala.T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif.K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Irvin,Pa. U5	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va.W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 .....$7.85
Fairfield,Ala. T2 .....7.95
Fairless,Pa. U5 .....7.95
Fontana,Calif. K1 .....8.60
Gary,Ind. U5 .....7.85
GraniteCity,Ill. G4 .....7.95
Ind.Harbor,Ind. I-2, Y1.7.85
Irvin,Pa. U5 .....7.85
Niles,O. R2 .....7.85
Pittsburg,Calif. C11 ....8.60
SparrowsPoint,Md. B2 ..7.95
Weirton,W.Va. W6 .....7.85
Yorkville,O. W10 .....7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5 .....$7.50
Gary,Ind. U5 .....7.50
GraniteCity,Ill. G4 .....7.60
Ind.Harbor,Ind. Y1 ....7.50
Irvin,Pa. U5 .....7.50
Yorkville,O. W10 .....7.50

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5 .....$9.70
Irvin,Pa. U5 .....9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5 .....$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..7.65
Aliquippa,Pa. J5 .....7.65
Alton,Ill. L1 .....7.85
Atlanta A11 .....7.85
Bartonville,Ill. K4 .....7.75
Buffalo W12 .....7.65
Chicago W13 .....7.65
Cleveland A7, C20 .....7.65
Crawfordsville,Ind. MS..7.75
Donora,Pa. A7 .....7.65
Duluth A7 .....7.65
Fairfield,Ala. T2 .....7.65
Fostoria,O.(24) S1 .....7.75
Houston S5 .....7.90
Jacksonville,Fla. MS ...8.00
Johnstown,Pa. B2 .....7.65
Joliet,Ill. A7 .....7.65
KansasCity,Mo. S5 .....7.90
Kokomo,Ind. C16 .....7.75
LosAngeles B3 .....8.60
Minnequa,Colo. C10 .....7.90
Monessen,Pa. P7, P16...7.65
N.Tonawanda,N.Y. B11..7.65
Palmer,Mass. W12 .....7.95
Pittsburg,Calif. C11 ....8.60
Portsmouth,O. P12 .....7.65
Rankin,Pa. A7 .....7.65
S.Chicago,Ill. R2 .....7.65
S.SanFrancisco C10 ....8.60
SparrowsPoint,Md. B2 ..7.75
Sterling,Ill.(1) N15 ....7.65
Sterling,Ill. N15 .....7.75
Struthers,O. Y1 .....7.65
Waukegan,Ill. A7 .....7.65
Worcester,Mass. A7 ....7.95

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4 .....12.65
Buffalo W12 .....12.65
Cleveland A7 .....12.65
Donora,Pa. A7 .....12.65
Duluth A7 .....12.65
Johnstown,Pa. B2 .....12.65
Minnequa,Colo. C10 ....12.775
Monessen,Pa. P16 .....12.65
Muncie,Ind. I-7 .....12.85
NewHaven,Conn. A7 ....12.95
Palmer,Mass. W12 .....12.95
Pittsburg,Calif. C11 ....13.45
Portsmouth,O. P12 .....11.90
Roebling,N.J. R5 .....12.95
SparrowsPt.,Md. B2 ....12.75
Struthers,O. Y1 .....12.65
Trenton,N.J. A7 .....12.95
Waukegan,Ill. A7 .....12.65
Worcester,Mass. A7 ....12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....9.30
Alton,Ill. L1 .....9.50
Buffalo W12 .....9.30
Cleveland A7 .....9.30
Donora,Pa. A7 .....9.30
Duluth A7 .....9.30
Johnstown,Pa. B2 .....9.30
KansasCity,Mo. S5 .....9.55
LosAngeles B3 .....10.25
Minnequa,Colo. C10 .....9.50
Monessen,Pa. P7, P16...9.30
NewHaven,Conn. A7 ....9.60
Palmer,Mass. W12 .....9.60
Pittsburg,Calif. C11 ..10.25
Portsmouth,O. P12 .....9.30
Roebling,N.J. R5 .....9.60
S.Chicago,Ill. R2 .....9.30
S.SanFrancisco C10 ....10.25
SparrowsPt.,Md. B2 ....9.40
Struthers,O. Y1 .....9.30
Trenton,N.J. A7 .....9.60
Waukegan,Ill. A7 .....9.30
Worcester,Mass. A7 ....9.60

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 .....9.30
Alton,Ill. L1 .....9.50
Bartonville,Ill. K4 .....9.40
Buffalo W12 .....9.30
Cleveland A7 .....9.30
Donora,Pa. A7 .....9.30
Duluth A7 .....9.30
Fostoria,O. S1 .....9.35
Johnstown,Pa. B2 .....9.30
KansasCity,Mo. S5 .....9.55
LosAngeles B3 .....10.25
Milbury,Mass.(12) N6..9.325
Minnequa,Colo. C10 .....9.55
Monessen,Pa. P7, P16..9.30
Muncie,Ind. I-7 .....9.50
Palmer,Mass. W12 .....9.60
Pittsburg,Calif. C11 ....10.25
Portsmouth,O. P12 .....9.30
Roebling,N.J. R5 .....9.60
S.Chicago,Ill. R2 .....9.30
S.SanFrancisco C10 ....10.25
SparrowsPt.,Md. B2 ....9.40
Struthers,O. Y1 .....9.30
Trenton,N.J. A7 .....9.60
Waukegan,Ill. A7 .....9.30
Worcester, A7, J4, T6...9.60

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 .....15.80
Bartonville,Ill. K4 ....15.70
Buffalo W12 .....15.60
Chicago W13 .....15.60
Cleveland A7 .....15.60
Crawfordsville,Ind. MS.15.70
Fostoria,O. S1 .....15.60
Houston S5 .....15.85
Jacksonville,Fla. MS ...15.95
Johnstown,Pa. B2 .....15.60
KansasCity,Mo. S5 .....15.85
Kokomo,Ind. C16 .....15.60
Minnequa,Colo. C10 ....15.85
Monessen,Pa. P7, P16..15.60
Muncie,Ind. I-7 .....15.80
Palmer,Mass. W12 .....15.90
S.SanFrancisco C10 ....16.45
Waukegan,Ill. A7 .....15.60
Worcester,Mass. A7, T6.15.90

ROPE WIRE

Bartonville,Ill. K4 ....12.75
Buffalo W12 .....12.75
Fostoria,O. S1 .....12.75
Johnstown,Pa. B2 .....12.75
Monessen,Pa. P7 .....12.75
Muncie,Ind. I-7 .....12.95
Palmer,Mass. W12 .....13.05
Portsmouth,O. P12 .....12.75
Roebling,N.J. R5 .....13.05
SparrowsPt.,Md. B2 ....12.85
Struthers,O. Y1 .....12.75
Worcester,Mass. J4 ....13.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Tire Bead

Bartonville,Ill. K4	16.55
Monessen,Pa. P16	16.55
Roebling,N.J. R5	17.05

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	11.65
Baltimore T6	11.95
Boston T6	11.95
Buffalo W12	11.65
Chicago W13	11.75
Cleveland A7	11.65
Crawfordsville,Ind. M8	11.65
Dover,O. G6	11.65
Fostoria,O. S1	11.95
FranklinPark,Ill. T6	11.75
Kokomo,Ind. C16	11.65
Massillon,O. R8	11.65
Milwaukee C23	11.85
Monessen,Pa. P7, P16	11.65
Palmer,Mass. W12	11.95
Pawtucket,R.I. N8	11.95
Philadelphia P24	11.95
Riverdale,Ill. A1	11.75
Rome,N.Y. R6	11.65
Sharon,Pa. S3	11.65
Trenton,N.J. R5	11.95
Warren,O. B9	11.65
Worcester,Mass. A7, T6	11.95

NAILS, Stock — **Col.**

AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Houston,Tex. S5	178
Fairfield,Ala. T2	173
Jacksonville,Fla.(20) M8	184
Joliet,Ill. A7	173
Johnstown,Pa. B2	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$8.95

NAILS, Cut (100 lb keg)

To Dealers (33)

Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

POLISHED STAPLES — **Col.**

AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	175
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	177
Donora,Pa. A7	175
Duluth A7	175
Fairfield,Ala. T2	175
Jacksonville,Fla.(20) M8	186
Joliet,Ill. A7	175
Johnstown,Pa. B2	175
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	175
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)

Coil No. 3150

AlabamaCity,Ala. R2	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	9.82
Chicago W13	10.26
Crawfordsville,Ind. M8	10.36
Donora,Pa. A7	10.26
Duluth A7	10.26
Fairfield,Ala. T2	10.26
Houston S5	10.51
Jacksonville,Fla. M8	10.82
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	10.26
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	10.36
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	11.04
S.Chicago,Ill. R2	10.26
S.SanFraicisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(37) N15	10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.15
Chicago W13	10.60
Crawfordsville,Ind. M8	10.70
Donora,Pa. A7	10.60
Duluth A7	10.60
Fairfield,Ala. T2	10.60
Houston S5	10.85
Jacksonville,Fla. M8	11.16
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	10.60
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	10.70
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	11.40
S.Chicago,Ill. R2	10.60
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$10.65
Atlanta A11	10.75
Bartonville,Ill. K4	10.75
Buffalo W12	10.20
Chicago W13	10.65
Crawfordsville,Ind. M8	10.75
Donora,Pa. A7	10.65
Duluth A7	10.65
Fairfield,Ala. T2	10.65
Houston S5	10.90
Jacksonville,Fla. M8	11.21
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	10.65
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	10.75
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	11.45
S.Chicago,Ill. R2	10.65
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	10.75

BALE TIES, Single Loop — **Col.**

AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	219
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
Sterling,Ill.(7) N15	214
SparrowsPt.,Md. B2	214
Williamsport,Pa. S19	175

FENCE POSTS

Birmingham C15	171
ChicagoHts.,Ill. C2, I-2	172
Duluth A7	172
Franklin,Pa. F5	172
Huntington,W.Va. C15	171
Johnstown,Pa. B2	172
Marion,O. P11	172
Minnequa,Colo. C10	177
Sterling,Ill.(1) N15	172
Tonawanda,N.Y. B12	174

WIRE, Barbed — **Col.**

AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198*
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston,Tex. S5	198**
Jacksonville,Fla. M8	203
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196*
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193**
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213**
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198§

WOVEN FENCE, 9-15 Ga. — **Col.**

Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-14½ga.J5	190§
Atlanta A11	192*
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston,Tex. S5	192**
Jacksonville,Fla. M8	197
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192§

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.15	18.70**
Aliq'ppa,Pa.	J5.17.15	18.95
Bartonville K4	17.25	19.05
Cleveland A7	17.15	....
Crawf'dsville M8	17.25	19.05
Fostoria,O. S1	17.65	19.20†
Houston S5	17.40	18.95**
Jacksonville M8	17.50	19.30
Johnstown B2	17.15	18.95§
Kan.City,Mo. S5	17.40	....
Kokomo C16	17.25	18.80†
Minnequa C10	17.40	18.95**
P'lm'r,Mass. W12	17.45	19.00†
Pitts.,Calif. C11	17.50	19.05†
SparrowsPt. B2	17.25	19.05§
Sterling(37) N15	17.25	19.05§
Waukegan A7	17.15	18.70†
Worcester A7	17.45	....

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
Ala.City,Ala. R2	8.65	9.20**
Aliquippa J5	8.65	9.325§
Atlanta (48) A11	8.75	9.425*
Bartonville(48) K4	8.75	9.425
Buffalo W12	8.65	9.20†
Cleveland A7	8.65	....
Crawfordsville M8	8.75	9.425
Donora,Pa. A7	8.65	9.20†
Duluth A7	8.65	9.20†
Fairfield T2	8.65	9.20†
Houston(48) S5	8.90	9.45**
Jacks'ville,Fla. M8	9.00	9.675
Johnstown B2(48)	8.65	9.325§
Joliet,Ill. A7	8.65	9.20†
Kans.City(48) S5	8.90	9.45**
Kokomo C16	8.75	9.30†
LosAngeles B3	9.60	10.275§
Minnequa C10	8.90	9.45**
Monessen P7(48)	8.65	9.25*
Palmer,Mass. W12	8.95	9.50†
Pitts.,Calif. C11	9.60	10.15†
Rankin,Pa. A7	8.65	9.20†
S.Chicago R2	8.65	9.20**
S.SanFran. C10	9.60	10.15**
Spar'wsPt.B2(48)	8.75	9.425§
Sterling(48) N15	8.90	9.575§
Sterling(1)(48)	8.80	9.475§
Struth'rs.O.(48)Y1	8.65	9.30‡
Worcester,Mass.A7	8.95	9.50†

Based on zinc price of: *13.50c. †5c. §10c. ‡Less than 10c. ††10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
6 in. and shorter	52.5
Longer than 6 in.	43.5
⅝ in. thru 1 in.:	
6 in. and shorter	43.5
Longer than 6 in.	41.5
1⅛ in. and larger:	
All lengths	41.5

Undersized Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	52.5

Carriage, Machine, Lag Bolts

Hot Galvanized:

½ in. and smaller:	
6 in. and shorter	32.0
Longer than 6 in.	19.0
⅝ in. and larger:	
All lengths	16.0

Lag Bolts (all diam.)

6 in. and shorter	52.5
Longer than 6 in.	44.5

Plow and Tap Bolts

½ in. and smaller by 6 in. and shorter	52.0
Larger than ½ in. or longer than 6 in.	44.5
Blank Bolts	44.5
Step, Elevator, Tire Bolts	52.0

Stove Bolts, Slotted:

⅛ to ¼-in. incl., 3 in. and shorter	54.00
⅝ to ½ in., inclusive	54.00

NUTS

Reg. & Heavy Square Nuts: All sizes	58.0
Square Nuts, Reg. & Heavy, Hot Galvanized: All sizes	44.0

Hex Nuts, Reg. & Heavy, Hot Pressed:

¾ in. and smaller	61.5
⅞ in. to 1 in., incl.	57.5
1⅛ in. to 1½ in., incl.	62.5
1⅝ in. and larger	56.0

Hex Nuts, Reg. & Heavy, Cold Punched:

¾ in. and smaller	61.5
⅞ in. to 1½ in., incl.	57.5
1⅝ in. and larger	56.0

Hex Nuts, All Types, Hot Galvanized:

¾ in. and smaller	48.0
⅞ in. to 1 in., incl.	44.0
1⅛ in. to 1½ in., incl.	49.0

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	61.5
⅞ in. to 1½ in., incl.	57.5
1⅝ in. and larger	56.0

Hex Nuts, Finished (Incl. Slotted and Castillated):

1 in. and smaller	64.0
1⅛ in. to 1½ in., incl.	60.5
1⅝ in. and larger	56.0

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	61.5
¾ in. to 1 in., incl.	64.0
1⅛ in. to 1½ in., incl.	60.5
1⅝ in. and larger	56.0

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:

6 in. and shorter:	
⅝ in. and smaller	44.0
¾, ⅞ and 1 in. diam.	27.0
Longer than 6 in.:	
⅝ in. and smaller	14.0
¾, ⅞ and 1 in. diam.	0.5

High Carbon, Heat Treated:

6 in. and shorter:	
⅝ in. and smaller	31.0
¾, ⅞ and 1 in. diam.	9.0
Longer than 6 in.:	
⅝ in. and smaller	+6
¾, ⅞ and 1 in. diam.	+24

Flat Head Capscrews:

¾ in. and smaller	+65.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:	
6 in. and shorter	11
Longer than 6 in.	+10

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.25

7/8 in. under list less 19%.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	25.98	23.54
1¼	13	....	30.78	23.36
1½	13	29.03	34.01	25.83
1¾	13	34.29	40.18	30.51
2	13	38.44	45.05	34.20
2¼	13	43.29	50.75	38.52
2¼	12	46.99	55.06	41.81
2½	12	51.76	60.65	46.05
2¾	12	56.04	65.67	49.88
3	12	59.76	70.03	53.19

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	5.525	5.425	....	6.50
Ensley,Ala. T2	5.525	5.425	....	6.50
Fairfield,Ala. T2	....	....	....	6.50
Huntington,W.Va. C15	....	....	....	6.50
Gary,Ind. U5	5.525	5.425	....	....
IndianaHarbor,Ind. I-2	5.525	5.425	5.475	....
Johnstown,Pa. B2	....	....	....(16)	6.50
Lackawanna,N.Y. B2	5.525	5.425	....	6.50
Minnequa,Colo. C10	5.525	5.425	....	7.00
Steelton,Pa. B2	5.525	5.425	....	....
Williamsport,Pa. S19	....	....	....	6.50

TIE PLATES

Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.60
Ind.Harbor,Ind. I-2	6.60
Lackawanna,N.Y. B2	6.60
Minnequa,Colo. C10	6.60
Seattle B3	6.75
Steelton,Pa. B2	6.60
Torrance,Calif. C11	6.75

JOINT BARS

Bessemer,Pa. U5	6.975
Fairfield,Ala. T2	6.975
Ind.Harbor,Ind. I-2	6.975
Joliet,Ill. U5	6.975
Lackawanna,N.Y. B2	6.975
Minnequa,Colo. C10	6.975
Steelton,Pa. B2	6.975

AXLES

Ind.Harbor,Ind. S13	8.775
Johnstown,Pa. B2	8.775

TRACK BOLTS, Untreated

Cleveland R2	14.75
KansasCity,Mo. S5	14.75
Lebanon,Pa. B2	14.75
Minnequa,Colo. C10	14.75
Pittsburgh P14	14.75
Seattle B3	15.25

SCREW SPIKES

Lebanon,Pa. B2	14.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2, Y1	9.75
KansasCity,Mo. S5	9.75
Lebanon,Pa. B2	9.75
Minnequa,Colo. C10	9.75
Pittsburgh J5	9.75
Seattle B3	10.25
S.Chicago,Ill. R2	9.75
Struthers,O. Y1	9.75
Youngstown R2	9.75

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 13 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.15c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 6.045c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.50c.
(31) Widths over ⅝-in.; 7.60c, for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(45) 0.022 in. and lighter, over 0.022", 8.20c.
(46) Special quality.
(48) 6-7 Ga.
(49) 3½-in. and smaller rounds; 8.65c, over 3½-in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+9.25	+24.5	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Ambridge, Pa. N2	+9.25	....	+2.75	....	+0.25	....	1.25	....	1.25	....	1	....	3.5	....
Lorain, O. N3	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Youngstown Y1	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Alton, Ill. L1	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Benwood, W. Va. W10	4.5	+22	+7.5	+31	+18	+39.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Butler, Pa. F6	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Fairless, Pa. N3	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Fontana, Calif. K1	....	....	....	....	....	....	+8.25	+23.5	+5.25	+19.5	+1.75	+15	0.75	+14.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	4.25	+11	7.25	+7	10.75	+2.5	13.25	+3.25
Lorain, O. N3	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sharon, Pa. S4	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sparrows Pt., Md. B2	3.5	+23	8.5	+32	+19	+40.5	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Wheatland, Pa. W9	5.5	+21	+6	+30	+17	+38.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Youngstown R2, Y1	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Alton, Ill. L1	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	....	....	....	....
Benwood, W. Va. W10	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Etna, Pa. N2	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Fairless, Pa. N3	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Fontana, Calif. K1	1.25	+13.25	1.75	+12.75	3.25	+13	3.25	+13	+7.25	+24	+7.25	+24
Indiana Harbor, Ind. Y1	13.75	+0.75	14.25	+0.25	15.75	+0.5	15.25	+0.5	5.25	+11.5	5.25	+11.5
Lorain, O. N3	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sharon, Pa. M6	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sparrows Pt., Md. B2	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Wheatland, Pa. W9	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Youngstown R2, Y1	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5

*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	....	42.00	44.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
303	....	32.00	41.00	....	45.50	48.00	50.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	50.75	55.50	55.50
304L	....	....	48.25	51.50	53.00	55.50	58.50	63.25	63.25
305	28.50	36.75	42.50	47.50	45.25	47.75	51.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	60.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
314	....	....	....	....	86.50	....	92.75	....	104.50
316	39.75	49.50	62.25	69.25	69.25	73.00	76.75	81.50	81.50
316L	....	....	70.00	76.50	77.00	80.75	84.50	89.25	89.25
317	48.00	60.00	76.75	88.25	86.25	90.75	93.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
330	....	....	118.75	....	132.00	138.50	105.50	108.00	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	69.75	79.25	79.25
403	....	....	32.00	....	35.75	37.75	40.25	48.25	48.25
405	19.50	25.50	29.75	36.00	33.50	35.25	37.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	35.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	36.25	48.25	48.25
420	....	33.50	34.25	41.75	39.25	41.25	45.25	62.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	36.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	36.75	51.75	51.75
431	....	28.75	37.75	....	42.00	44.25	46.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	47.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Div., H. K. Porter Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Charter Wire Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Elwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Jones & Laughlin Steel Corp.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Superior Steel Corp.; Superior Tube Co.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Univeral-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

Stainless	Plates—Carbon Base 5%	10%	15%	20%	Sheets Carbon Base 20%
302	....	....	....	....	37.50
304	34.70	37.95	42.25	46.70	40.00
304L	36.90	40.55	45.10	49.85	....
316	40.35	44.40	49.50	54.50	58.75
316L	45.05	49.35	54.70	60.10	....
316 Cb	47.30	53.80	61.45	69.10	....
321	36.60	40.05	44.60	49.30	47.25
347	38.25	42.40	47.55	52.80	57.00
405	28.60	29.85	33.35	36.85	....
410	28.15	29.55	33.10	36.70	....
430	28.30	29.80	33.55	37.25	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
*Copper**	*33.95*	*40.25*

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.290	Cr Hot Work	0.45-0.495
Extra Carbon	0.345	W-Cr Hot Work	0.43-0.475
Special Carbon	0.41-0.45	V-Cr Hot Work	0.460
Oil Hardening	0.450	Hi-Carbon-Cr	0.830

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	4.170
18.25	4.25	1	4.75	....	2.385
18	4	2	9	....	2.755
18	4	2	....	....	1.845
18	4	1	....	....	1.680
9	3.5	..	....	....	1.275
13.5	4	3	....	....	1.945
13.75	3.75	2	5	....	2.325
6.4	4.5	1.9	....	5	1.185
6	4	3	....	6	1.430
1.5	4	1	....	8.5	1.040

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity,Ala. R2	62.00	62.50	....	....
Birmingham R2	62.00	62.50‡	....	....
Birmingham U6	....	62.50‡	66.50	....
Woodward,Ala. W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	....	66.50	....
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	68.46	68.96	68.96	69.46
Muskegon,Mich., deld.	....	80.33	80.33	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,O., deld.	69.12	69.62	69.62	70.12
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	66.50	67.00	67.50	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
New York, deld.	....	74.70	75.20	....
Newark,N.J., deld.	72.02	72.52	73.02	73.52
Philadelphia, deld.	69.88	70.38	70.88	71.38
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland, Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville, Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard, O. Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	67.00
Mansfield,O., deld.	70.90	....	71.40	71.90
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett, Mass. E1	66.50	67.00	67.50	....
Fontana,Calif. K1	74.00	74.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,O. I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.54	73.04	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.
Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.
Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,O. I-3, J1	77.25
Buffalo H1	78.50

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Troy,N.Y. R2 (Phos. 0.035% max)	74.00
Philadelphia, deld.	81.76
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Houston, Seattle no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††§		Carbon	Floor
Atlanta	8.59§	9.86§	10.13§	....	8.64	9.01	10.68	....	9.05	8.97	10.90
Baltimore	8.28	8.88	9.76	....	8.76	9.06	9.13¶	15.18	9.19	8.66	10.14
Birmingham	7.80	9.00	9.52	....	7.82	8.07	10.12	....	8.20	8.16	10.31
Boston	9.31	10.40	11.41	....	9.35	9.68	....	15.24	9.59	9.65	11.13
Buffalo	8.25	9.45	11.07	....	8.50	8.80	....	15.00	8.90	8.90	10.45
Chattanooga	7.99	9.24	9.10	....	8.00	8.24	10.04	....	8.44	8.40	10.26
Chicago	8.20	9.45	10.00	....	8.23	8.60	8.80	14.65	8.64	8.56	9.88
Cincinnati	8.34	9.48	10.05	....	8.54	8.92	9.31	14.96	9.18	8.93	10.21
Cleveland	8.18	9.45	9.95	....	8.33	8.69	....	14.74	9.01	8.79	10.11
Denver	9.38	11.75	....	....	9.41	9.78	11.10	....	9.82	9.74	11.06
Detroit	8.43	9.70	10.35	....	8.58	8.90	9.15	14.91	9.18	8.91	10.13
Erie, Pa.	8.20	9.45	9.95[10]	....	8.50	8.75	9.05[10]	....	9.00	8.85	10.10
Houston	8.45	9.75	8.45	....	8.60	9.05	11.10	....	9.10	9.05	10.30
Jackson, Miss.	8.09	9.34	9.79	....	8.16	8.41	10.23	....	8.54	8.50	10.34
Los Angeles	9.50	10.75	11.65	....	9.55	9.70	12.75	16.00	9.60	9.55	11.70
Milwaukee	8.33	9.58	10.13	....	8.36	8.73	9.03	14.78	8.85	8.69	10.01
Moline, Ill.	8.55	9.80	10.35	....	8.58	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	....	9.31	9.57	....	15.09	9.35	9.43	10.71
Norfolk, Va.	8.05	....	....	....	8.55	8.60	10.80	....	8.95	8.45	9.95
Philadelphia	8.00	8.90	9.97	51.94	8.67	8.65	9.76	15.01	8.50	8.77	9.77**
Pittsburgh	8.18	9.45	10.35	50.00	8.33	8.60	....	14.65	8.64	8.56	9.88
Portland, Oreg.	9.50	11.20	11.55	57.20	11.35‡‡	9.65	14.65	15.95	9.65	9.30	12.50
Richmond, Va.	8.00	....	10.14	....	8.55	8.40	10.00	....	8.95	8.40	9.90
St. Louis	8.54	9.79	10.36	....	8.59	8.97	9.41	15.01	9.10	8.93	10.25
St. Paul	8.79	10.04	10.61	....	8.84	9.22	9.66	....	9.38	9.30	10.49
San Francisco	9.35	10.75	11.00	54.85	9.45	9.70	13.00	16.10	9.50	9.60	12.00
Seattle	9.95	11.15	12.00	57.20	10.00	10.10	14.05	16.35	9.80	9.70	12.10
Spokane, Wash.	9.95	11.15	12.00	....	10.00	10.10	14.05	17.10	9.80	9.70	12.10
Washington	8.48	9.58	....	....	9.06	9.15	9.73	....	9.35	8.86	10.36

*Prices do not include gage extras; †prices include gage and coating extras, except in Birmingham (coating extra excluded); ‡includes 35-cent bar quality extras; §42 in. and under; **⅛-in. and heavier; ††as annealed; ‡‡over 4 in.; §§over 3 in.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg. 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; ³—400 to 9999 lb; ⁸—1000 to 1999 lb; ⁸—2000 to 3999 lb; ¹⁰—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, O., $138; Cutler, Utah, $165.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, O., Hawstone, Pa., $150; Warren, Niles, Windham, O., Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, O., $96.75; Clearfield, Pa., Portsmouth, O., $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Pa., $245.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Philadelphia, Clearfield, Orviston, Pa., $305.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Philadelphia, Clearfield, Orviston, Pa., $345.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, O., $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ½-in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ¾-in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-41; 70%, $36-40; 60%, $33-36.50. Imported, net tons, f.o.b. cars point of entry duty paid, metallurgical grade: European, $33-34; Mexican, all-rail, duty paid, $25.25-25.75; barge, Brownsville, Tex., $27.25-27.75.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: Deld. east of Mississippi river, ocean bags 23,000 lb and over.. F.o.b. Riverton or Camden, N. J., west of Mississippi river.	10.50 9.50
Sponge Iron, domestic, 98 + % Fe.: Deld. east of Mississippi river. 23,000 lb and over F.o.b. Riverton, N.J., west of Mississippi river	10.50 9.50
Sponge Iron, Canadian: F.o.b. shipping point	9.50
Electrolytic Iron: .. .. Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.00
Annealed, 99.5% Fe..	36.50
Unannealed (99+ % Fe)	36.00
Unannealed (99+ % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)..	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	

	Dollars
Aluminum: Atomized, 500 lb drum, fr'ght allowed	
Carlots	38.20
Ton lots	40.20
Antimony, 500 lb lots.	32.00*
Brass, 5000-lb lots	32.40-40.40†
Bronze, 5000-lb lots	50.20-54.70†
Copper: Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.15
Nickel-Silver, 5000-lb lots	50.70-55.30†
Phosphor-Copper, 5000-lb lots	62.00
Copper (atomized) 5000-lb lots	42.50-51.00‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.08
Stainless Steel, 316	$1.44
Tin	14.50*
Zinc, 5000-lb lots	17.50-30.70‡
Tungsten: Melting grade, 99% 60 to 2000 mesh: 1000 lb and over	3.75
Less than 1000 lb	3.90
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

——Inches—— Diam.	Length	Per 100 lb
2	24	$57.75
2½	30	37.25
3	40	35.25
4	40	33.25
5½	40	33.00
6	60	30.00
7	60	26.75
8, 9, 10	60	26.50
12	72	25.50
14	60	25.50
16	72	24.50
17	60	25.50
18	72	24.50
20	72	24.00
24	84	24.75

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305...	$6.58	$6.53	$6.53	$6.76
Bar Size Angles	6.62	6.57	6.57	6.75
Structural Angles	6.62	6.57	6.57	6.75
I-Beams	6.87	6.82	6.82	7.00
Channels	6.87	6.82	6.82	7.00
Plates (basic bessemer)	8.50	8.45	8.45	8.75
Sheets, H.R.	8.50	8.45	8.45	8.75
Sheets, C.R. (drawing quality)	9.00	8.95	8.95	9.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	26.79	26.67	26.67	27.36
Barbed Wire (†)	6.95	6.95	6.95	7.40
Merchant Bars	6.87	6.82	6.82	7.22
Hot-Rolled Bands	7.20	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	6.73	6.73	6.73	7.13
Wire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
Bright Common Wire Nails (§)	8.38	8.38	8.38	8.58

†Per 82-lb. net, reel. §Per 100-lb kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective for the 1957 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old range bessemer	11.85
Old range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	27.00-27.50
N. African hematite (spot)	nom.
Brazilian iron ore, 68-69%	32.00-33.00

Tungsten Ore

Net ton unit, before duty

Foreign wolframite, good commercial quality	20.00-23.00
Domestic, concentrates mine	55.00

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.60-1.70 per long ton unit, c.i.f. U. S. ports, duty for buyer's account: other than Indian, $1.45-1.50; contracts by negotiation.

Chrome Ore

Gross ton f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$55.00-58.00
48% 2.8:1	52.00-55.00
48% no ratio	46.00-48.00

South African Transvaal

48% no ratio	$40.00-41.00
44% no ratio	30.00-31.00

Turkish

48% 3:1	$59.00-62.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.18

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

55-60%	$2.90-3.30
60-65%	3.30-3.60

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.75-15.75
Connellsville, foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, deld.	32.25
Saginaw, deld.	33.83
Erie, Pa., ovens	30.50
Everett, Mass., ovens New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, O., ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Painesville, O., ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
Neville Island (Pittsburgh), Pa., ovens.	29.25
St. Paul, ovens	29.75
Chicago, deld.	33.24
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.80 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

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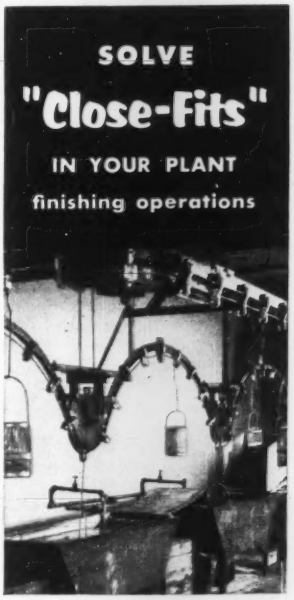

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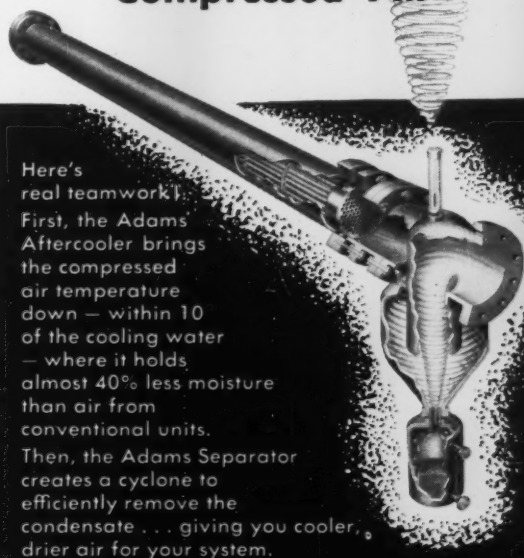

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MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net ton; $255, Johnstown, Duquesne, Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74% respectively.

(Mn 79-81%). Lump $263 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; 500 lb to 1999 lb, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk, 27.75c per lb of contained Cr; c.l. packed 29.3c, ton lot 31.05c; less ton 32.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 34.75c per lb contained Cr, 0.02% max 41.5c, 0.03% max 41c, 0.06% max 39.5c, 0.1% max 39c, 0.15% max 38.75c, 0.2% max 38.5c, 0.5% max 38.25c, 1.0% max 37.5c, 1.5% max 37.35c, 2.0% max 37.25c. Ton lot, add 3.4c, less ton add 5.1c. Carload packed add 1.75c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 29.05c per lb of contained Cr. Packed, c.l. 30.65c, ton 32.45c, less ton 33.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8M x D, 20.85c, per lb of alloy, ton lot 22.10c; less ton lots 23.3c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 39-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 41.35c per lb of contained Cr; 1" x down, bulk, 42.35c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ¼" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 13c per lb of contained Si. Packed c.l. 15.5c, ton lot 16.95c, less ton 18.6c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 20.00c per lb of Si. Packed, c.l. 21.65c, ton lot 22.95c, less ton 23.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy; ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (1 to 2%). Contract, lump, carload 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3⅝ lb each and containing 2 lb of Cr). Contract, carload, bulk 19c per lb of briquet, carload packed in box pallets 19.2c, in bags 20.1c; 3000 lb to c.l. in box pallets 20.4c; 2000 lb to c.l. in bags, 21.3; less than 2000 lb in bags 22.2c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l. bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l. bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l. pallets 9.65c; 2000 lb to c.l. bags 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.95 per lb of contained W; 2000 lb W to 5000 lb W, $3.05; less than 2000 lb W, $3.17. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot 2" x D, $4.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $4.25 per lb of contained Cb plus Ta, delivered; less ton lot $4.30.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5.7%, Fe 20% approx). Contract, c.l. packed ⅛-in. x 12 M 19c per lb of alloy, ton lot 20.15c, less ton 21.4c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5.7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

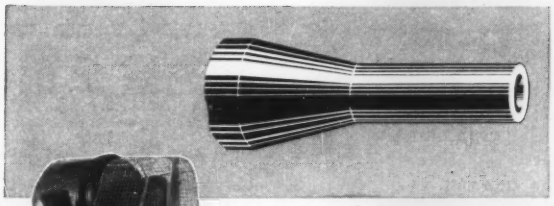
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

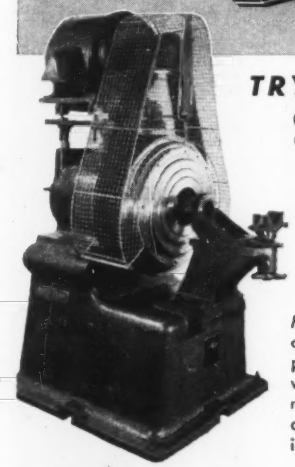
Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., $110 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.





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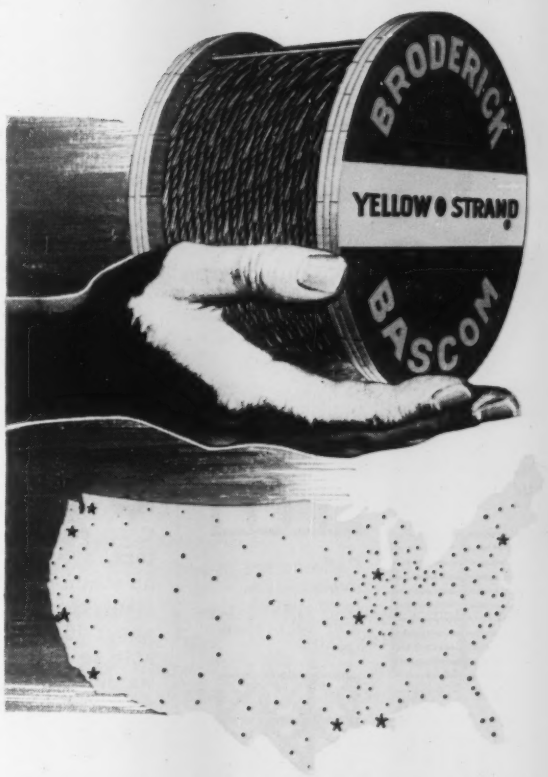

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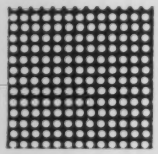

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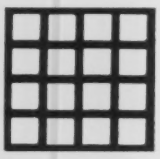

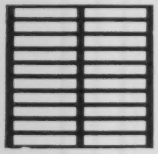

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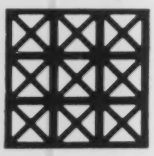

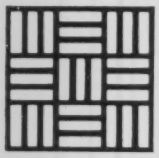

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Pig Iron . . .

Pig Iron Prices, Page 249

A gradual improvement in demand for pig iron is noted as foundries start production on some of their postvacation orders. Foundries which are turning out heavy castings for the railroad equipment and other industries are busier than those which make lighter castings.

Foundries are hoping to benefit from increased orders for automotive components as new model production gets under way. There also is hope for larger purchases of castings by farm implement makers.

Iron Ore . . .

Iron Ore Prices, Page 250

Shenango Furnace Co., Pittsburgh, announced plans for a 710-ft ore freighter to be constructed by the American Shipbuilding Co. at its Toledo, Ohio, yard. Completion is scheduled for the spring of 1959. The vessel will cost about $8 million and will displace 32,210 long tons. Its ultimate ore carrying capacity is placed at 25,000 tons, and, equipped with an 8500-hp steam turbine, gear-drive power plant, the ship will have a speed of about 16 miles an hour. It will be able to operate in fresh and salt water, and make trips to loading points of the Labrador and Quebec ore fields.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2300 tons, framing for electric furnaces and other construction at Bethlehem Pacific Coast Steel Corp.'s plant at Seattle, to that company.

175 tons, state highway bridge, Luzerne County, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa., through Rogers Construction Co.

STRUCTURAL STEEL PENDING

325 tons, 2-span welded girder bridge, Greenwich, Conn.; bids Aug. 19, Hartford, Conn.

145 tons, grade separation, East Lyme, Conn.; bids Aug. 19, Hartford, Conn.; also 60 tons of reinforcing bars, and 100 tons of mat reinforcement.

135 tons, grade separation, Waterford, Conn.; bids Aug. 19, Hartford, Conn.; also 65 tons of reinforcing bars.

120 tons, rebuilding bridge, Scranton, Pa.; bids Aug. 30, Harrisburg, Pa.

REINFORCING BARS . . .

REINFORCING BARS PENDING

9000 tons, State Department office building annex, Washington, D. C., to Sweet's Steel Co., Williamsport, Pa.; John McShain Inc., Philadelphia, is general contractor.

1575 tons, state highway bridges, York, Pa.; bids Aug. 30, Harrisburg, Pa.; also 865 tons of highway mat reinforcing; 2575 tons, fabricated structural steel, 17,788 linear feet of piling.

906 tons, Keen Creek Dam, Howard Prairie Canal and Green Springs power conduit, Rogue River basin project, near Ashland, Oreg.; bids to Bureau of Reclamation, Camp White, Oreg., on various schedules, Sept. 10 and 12.

840 tons, roadway and ramp viaducts, Hartford, Conn.; bids Aug. 19, Hartford, Conn.; also 2185 tons of steel piles, including 260 tons of sheet piling, and 2800 tons of fabricated structural steel, including 78 tons of low alloy.

600 tons, Boeing Airplane plant addition, Seattle; bids in.

500 tons, 0.25 mile of Northern Illinois Toll Highway, Contract T-1D, Thornton Township, Cook County, Ill., for Illinois State Toll Highway Commission, Chicago; bids Aug. 29.

500 tons, substructure, Wetherfield-Glastonbury bridge, Greater Hartford Bridge Authority; Brunalli Construction Co., Southington, Conn., low on general contract; also 124,000 linear feet of steel piling.

205 tons, two plate girder bridges, Girard township, Erie County, N. Y.; bids Aug. 20, Harrisburg, Pa.; also 855 tons, fabricated structural steel.

175 tons, two I-beam bridges, Palmyra, Pa.; bids Aug. 30, Harrisburg, Pa.; also 500 tons of fabricated structural steel, and 1056 linear feet of piling.

193 tons, Washington state overcrossing, Whatcom County; bids to Olympia, Aug. 27.

150 tons, 2-span welded girder bridge, Greenwich, Conn.; bids Aug. 19 at Hartford, Conn.

PLATES . . .

PLATES PENDING

200 tons plus, storage facilities, Sage project, McChord Air Base, Washington state; general contract to Milone & Tucci, Tacoma, low $334,424 by U. S. engineer, Seattle.

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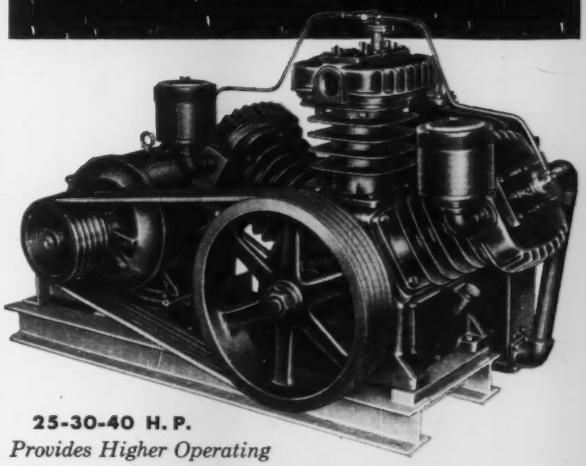

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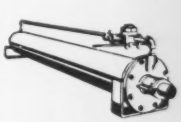

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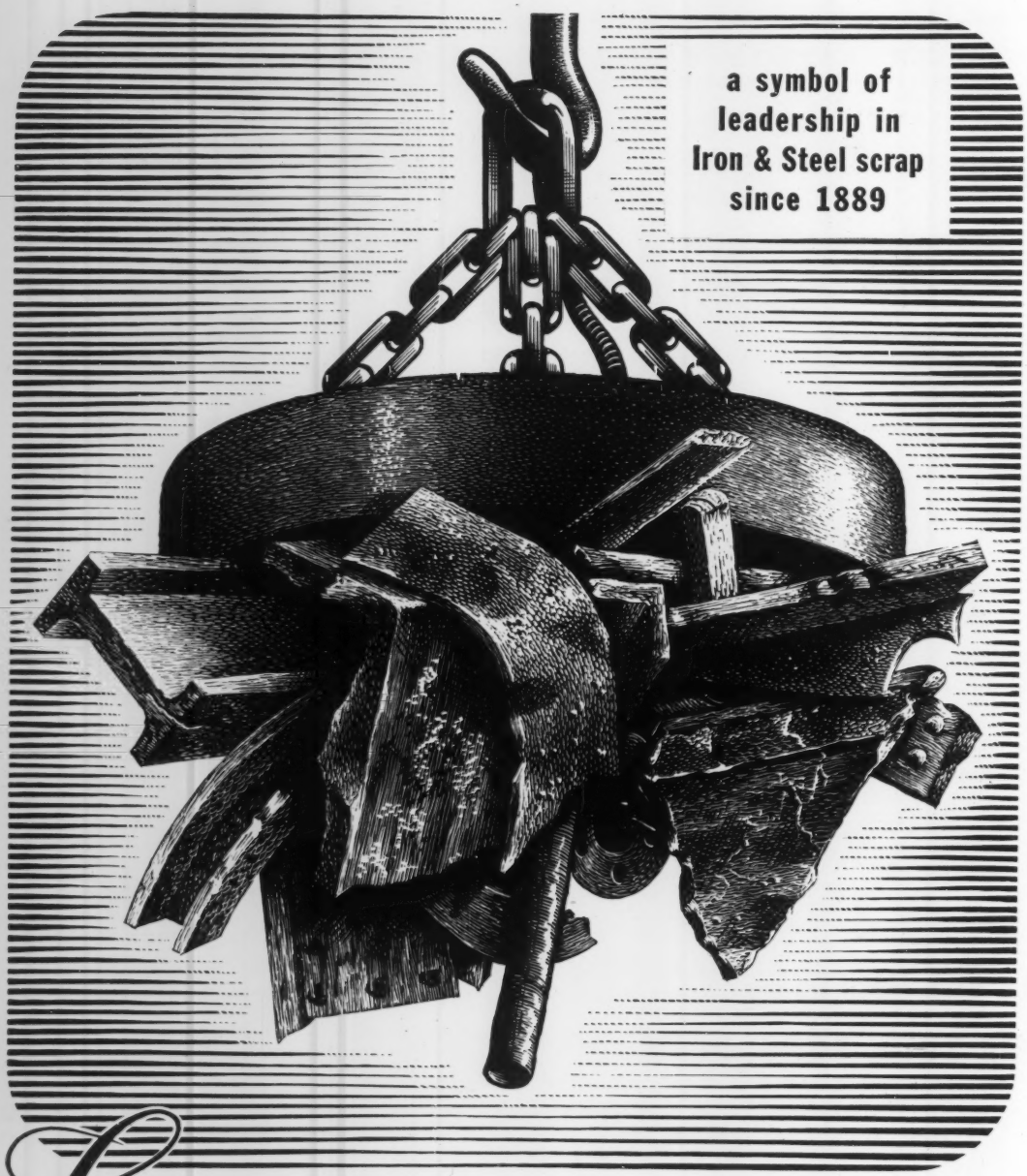

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Heavy Export Demand Supports Scrap

STEEL's composite on No. 1 heavy melting holds at $53.83 despite a sluggish domestic market. Heavy shipments abroad are keeping supplies low at collection points

Scrap Prices, Page 258

Pittsburgh — An independent mill in this area confirmed the prevailing opinion of market strength by purchasing No. 1 heavy melting scrap for $56 a ton. It was a decrease of $1 from the most recent important mill buy, but the market had weakened in the meantime.

A steelmaker here, which had shut down a blast furnace for repairs, was forced to increase its purchasing of No. 2 bundles to make up for the loss of hot metal. With demand increasing for that grade, price is now $46 a ton.

Chicago—Purchases of scrap by a local mill have reaffirmed recent quotations on the majority of steelmaking grades. Prices on No. 2 heavy melting and No. 1 railroad heavy melting declined $1 a ton. Blast furnace grades sold off $2 a ton.

For the moment at least, consumers have been successful in throttling asking prices which range $2 to $3 a ton above their bids. Factors helping to do this are good inventories at mills and a district steelmaking rate that continues to hold at 13 to 15 points below full capacity. There still remains, however, the buoyancy stemming from the prospect of expanded operations in the fourth quarter.

Philadelphia—Demand for steel scrap for export is heavy in this district. In the absence of heavy domestic shipments, close to 75 per cent of tonnage moved is going to Port Richmond docks. No. 1 heavy melting is bringing as high as $56, f.a.s. Most of this tonnage is coming from Philadelphia district yards, including those in Camden, N. J. Sustained demand has lowered yard reserves. At shipping points where freight is over $2.50 to Philadelphia, scrap material is moving to domestic mills. Prices for railroad specialties are slightly higher.

New York — Nickel - bearing stainless steel scrap prices are off sharply. Brokers have lowered buying prices on 18-8 grades $20 a ton and may slash prices an additional $10 a ton. Demand has declined, notably for borings and turnings. Steel scrap prices are generally unchanged, although No. 2 bundles are off slightly. Domestic shipments are light, but boatloading for export is active with brokers paying $2 a ton higher for No. 2 steel than for delivery to eastern mills within a limited freight area from New York.

Boston — The market on No. 2 heavy melting steel scrap has firmed here with brokers paying $35 to $36, f.o.b. shipping point. Domestic shipments of primary heavy melting grades are slow. For export, brokers are paying $5 to $7 a ton higher, delivered dock, than for tonnages to be shipped to domestic consumers. Yards are paying around $36.50 to $37.50 for unprepared No. 1 heavy melting.

Cleveland—Activity in the market here is confined to light shipments on old contracts. Yards are well supplied with material. Consensus among brokers and dealers is that the next price move could be in either direction.

Youngstown—The scrap market here continues listless. A considerable tonnage is piling up in dealers' yards. There is no indication of any marked pickup in demand in the near future. There have been no recent sales of No. 2 material, but some No. 1 scrap is moving on previously placed orders.

Detroit—The scrap market here is sluggish, due chiefly to the strike at Great Lakes Steel Corp., Ecorse, Mich. Undertone of the market is soft.

Buffalo—Mill scrap prices have advanced from $3 to $3.50 a ton here with the placing of new orders for August delivery. No. 1 heavy melting steel is up $3 to a range of $49-$50; No. 2 heavy melting, up $3.50 to $42.50-$43.50; No. 2 bundles, up $3.50 to $39.50-$40.50.

Cast scrap also is $1 higher with a new sale of No. 1 cupola at $49. Blast furnace scrap has failed to follow open-hearth grades into higher ground. In fact, some lower quotations are posted in the blast furnace section of the list, reflecting a tendency of steel mills to hold down the use of scrap in pig iron melts.

The new mill orders clarify the price situation in Buffalo following many weeks of uncertainty.

Cincinnati — Prices on major steelmaking grades of scrap remain unchanged with brokers working off old orders. No. 2 bundles show some easing and bids by brokers have been lowered $1 a ton to a range of $41-42. Steelmakers in the area are beginning to step up operations following the usual summer slowdown. This is strengthening the scrap market.

Birmingham—Scrap is moving at a fair rate, but brokers must split orders among more dealers than normally because of the slowness of material coming into the yards. Many mills, however, filled most of their needs from recent railroad and industrial lists. Buying from dealers is light.

San Francisco — No. 1 heavy melting steel scrap price is down $1 a ton. The market is still weak at the lower level. Export demand has disappeared, while mill buying is light as the result of the heavy supplies on hand. Prices on cast grades are practically unchanged. No. 1 cupola is firm.

Los Angeles — Dealers report that uncertain government policies regarding scrap exports to Japan are hampering their planning. Offshore activity, always a major factor in western market operations, has slackened noticeably.

Seattle—Exporters confirm reports that some Japanese buyers have asked a moratorium on current scrap commitments because of a shortage of dollars. Old contracts have been well cleaned up at Pacific ports, although a few cargoes are yet to be dispatched. Shippers expect that transpacific volume will resume in October. By that time, they figure consumers will be out of supplies and the financial situation will have improved. Locally, the turnover is fair.

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, Aug. 14, 1957. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Aug. 14	$53.83
Aug. 7	53.83
July Avg.	54.67
Aug. 1956	57.13
Aug. 1952	43.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	55.00-56.00
No. 2 heavy melting	*47.00-48.00*
No. 1 factory bundles	63.00-64.00
No. 1 dealer bundles	55.00-56.00
No. 2 bundles	*45.00-46.00*
No. 1 busheling	55.00-56.00
Machine shop turnings	33.00-34.00
Mixed borings, turnings	33.00-34.00
Short shovel turnings	37.00-38.00
Cast iron borings	37.00-38.00
Cut Structurals:	
2 ft and under	63.00-64.00
3 ft lengths	62.00-63.00
Heavy turnings	50.00-51.00
Punchings & plate scrap	62.00-63.00
Electric furnace bundles	62.00-63.00

Cast Iron Grades

No. 1 cupola	49.00-50.00
Heavy breakable cast	47.00-48.00
Unstripped motor blocks	36.00-37.00
No. 1 machinery cast	59.00-60.00

Railroad Scrap

No. 1 R.R. heavy melt.	64.00-65.00
Rails, 2 ft and under	75.00-76.00
Rails, 18 in. and under	76.00-77.00
Rails, random lengths	73.00-74.00
Railroad specialties	*72.00-73.00*

Stainless Steel Scrap

18-8 bundles & solids	300.00-315.00
18-8 turnings	190.00-215.00
430 bundles & solids	80.00-85.00
430 turnings	55.00-60.00

CLEVELAND

No. 1 heavy melting	52.00-53.00
No. 2 heavy melting	44.00-45.00
No. 1 factory bundles	57.00-58.00
No. 1 bundles	52.00-53.00
No. 2 bundles	40.00-41.00
No. 1 busheling	52.00-53.00
Machine shop turnings	23.00-24.00
Short shovel turnings	27.00-28.00
Mixed borings, turnings	27.00-28.00
Cast iron borings	27.00-28.00
Cut foundry steel	55.00-56.00
Cut structurals, plates 2 ft and under	63.00-64.00
Low phos. punchings & plate	53.00-54.00
Alloy free, short shovel turnings	30.00-31.00
Electric furnace bundles	53.00-54.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Charging box cast	43.00-44.00
Heavy breakable cast	41.00-42.00
Stove plate	50.00-51.00
Unstripped motor blocks	37.00-38.00
Brake shoes	41.00-42.00
Clean auto cast	54.00-55.00
Burnt cast	39.00-40.00
Drop broken machinery	56.00-57.00

Railroad Scrap

No. 1 R.R. heavy melt.	57.00-58.00
R.R. malleable	61.00-62.00
Rails, 2 ft and under	75.00-76.00
Rails, 18 in. and under	76.00-77.00
Rails, random lengths	68.00-69.00
Cast steel	*66.00-67.00*
Railroad specialties	*68.00-69.00*
Uncut tires	63.00-64.00
Angles, splice bars	*68.00-69.00*
Rails, rerolling	73.00-74.00

Stainless Steel
(Brokers' buying prices; f.o.b. shipping point)

19-8 bundles, solids	*280.00-290.00*
18-8 turnings	*180.00-190.00*
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

YOUNGSTOWN

No. 1 heavy melting	55.00-56.00
No. 2 heavy melting	48.00-49.00
No. 1 bundles	55.00-56.00
No. 2 bundles	45.00-46.00
No. 1 busheling	55.00-56.00
Machine shop turnings	23.00-24.00
Short shovel turnings	29.00-30.00
Cast iron borings	29.00-30.00
Low phos.	58.00-59.00
Electric furnace bundles	58.00-59.00

Railroad Scrap

No. 1 R.R. heavy melt.	62.00-63.00

CHICAGO

No. 1 heavy melt., indus.	55.00-56.00
No. 1 hvy melt., dealer	52.00-53.00
No. 2 heavy melting	*45.00-46.00*
No. 1 factory bundles	59.00-60.00
No. 1 dealer bundles	53.00-54.00
No. 2 bundles	41.00-42.00
No. 1 busheling, indus.	55.00-56.00
No. 1 busheling, dealer	52.00-53.00
Machine shop turnings	*34.00-36.00*
Mixed borings, turnings	*36.00-38.00*
Short shovel turnings	*36.00-38.00*
Cast iron borings	*36.00-38.00*
Cut structurals, 3 ft	58.00-59.00
Punchings & plate scrap	59.00-60.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Stove plate	45.00-46.00
Unstripped motor blocks	35.00-36.00
Clean auto cast	53.00-54.00
Drop broken machinery	53.00-54.00

Railroad Scrap

No. 1 R.R. heavy melt.	*58.00-59.00*
R.R. malleable	62.00-63.00
Rails, 2 ft and under	79.00-80.00
Rails, 18 in. and under	80.00-81.00
Angles, splice bars	69.00-70.00
Rails, rerolling	*75.00-78.00*

Stainless Steel Scrap

18-8 bundles & solids	*290.00-300.00*
18-8 turnings	*190.00-200.00*
430 bundles & solids	95.00-100.00
430 turnings	65.00-70.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	51.00-52.00
No. 2 heavy melting	*44.00-45.00*
No. 1 bundles	*52.00-53.00*
No. 2 bundles	38.00-39.00
No. 1 busheling	51.00-52.00
Machine shop turnings	27.00-28.00
Mixed borings, turnings	28.00-29.00
Short shovel turnings	29.00-30.00
Punchings & plate scrap	*56.00-58.00*

Cast Iron Grades

No. 1 cupola	51.00
Charging box cast	43.00
Stove plate	44.00
Heavy breakable	*42.00*
Unstripped motor blocks	*30.00-31.00*
Clean auto cast	52.00
Malleable	53.00†

†Nominal

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	49.50
No. 2 heavy melting	47.00
No. 1 bundles	49.50
No. 2 bundles	42.00
No. 1 busheling	49.50
Machine shop turnings	30.00
Short shovel turnings	32.00

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	42.00
Heavy breakable cast	42.00
Unstripped motor blocks	44.00
Brake shoes	40.00
Clean auto cast	48.00
Stove plate	44.00

Railroad Scrap

No. 1 R.R. heavy melt.	57.00
Rails, 18 in. and under	77.00
Rails, random lengths	70.00
Rails, rerolling	78.00
Angles, splice bars	63.00

PHILADELPHIA

No. 1 heavy melting	52.00
No. 2 heavy melting	46.00
No. 1 bundles	53.00
No. 2 bundles	43.50
No. 1 busheling	53.00
Electric furnace bundles	56.00-57.00
Mixed borings, turnings	37.00
Short shovel turnings	38.00-39.00
Machine shop turnings	35.00-36.00
Heavy turnings	48.00
Structurals & plate	58.00-59.00
Couplers, springs, wheels	*66.50-67.50*
Rail crops, 2 ft & under	69.00-71.00

Cast Iron Grades

No. 1 cupola	47.00
Heavy breakable cast	53.00
Malleable	62.00†
Drop broken machinery	57.00

†Nominal

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	50.00-51.00
No. 2 heavy melting	41.00-42.00
No. 1 bundles	50.00-51.00
No. 2 bundles	*38.50-39.00*
Machine shop turnings	26.00-27.00
Mixed borings, turning	27.00-28.00
Short shovel turnings	29.00-30.00
Low phos. (structural & plate	53.00-54.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Unstripped motor blocks	39.00-40.00
Heavy breakable	46.00-47.00

Stainless Steel

18-8 sheets, clips, solids	*260.00-265.00*
18-8 borings, turnings	*160.00-165.00*
430 sheets, clips, solids	60.00-70.00
410 sheets, clips, solids	50.00-55.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	41.00-42.00
No. 2 heavy melting	*35.00-36.00*
No. 1 bundles	41.00-42.00
No. 2 bundles	*34.00-34.50*
No. 1 busheling	41.00-42.00
Machine shop turnings	24.00-25.00
Mixed borings, turnings	27.00-28.00
Short shovel turnings	28.00-29.00
No. 1 cast	34.00-35.00
Mixed cupola cast	33.00-34.00
No. 1 machinery cast	42.00-43.00

BUFFALO

No. 1 heavy melting	*49.00-50.00*
No. 2 heavy melting	*42.50-43.50*
No. 1 bundles	*49.00-50.00*
No. 2 bundles	*39.50-40.50*
No. 1 busheling	*49.00-50.00*
Mixed borings, turnings	*33.00-34.00*
Machine shop turnings	31.00-32.00
Short shovel turnings	*34.00-35.00*
Cast iron borings	*33.00-34.00*
Low phos.	*55.00-56.00*

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*48.00-49.00*
No. 1 machinery	*53.00-54.00*

Railroad Scrap

Rails, random lengths	61.00-62.00
Rails, 3 ft and under	66.00-67.00
Railroad specialties	59.00-60.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	52.00-53.00
No. 2 heavy melting	46.00-47.00
No. 1 bundles	52.00-53.00
No. 2 bundles	*41.00-42.00*
No. 1 busheling	52.00-53.00
Machine shop turnings	33.00-34.00
Mixed borings, turnings	30.00-31.00
Short shovel turnings	36.00-37.00
Cast iron borings	30.00-31.00
Low phos. 18 in.	59.00-60.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast	42.00-43.00
Charging box cast	42.00-43.00
Drop broken machinery	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt.	56.00-57.00
Rails, 18 in. and under	71.00-72.00
Rails, random lengths	64.00-65.00

BIRMINGHAM

No. 1 heavy melting	49.00-50.00
No. 2 heavy melting	39.00-40.00
No. 1 bundles	49.00-50.00
No. 2 bundles	37.00-38.00
No. 1 busheling	49.00-50.00
Cast iron borings	*27.00-28.00*
Short shovel turnings	40.00-41.00
Machine shop turnings	39.00-40.00
Bar crops and plates	55.00-56.00
Structurals & plate	55.00-56.00
Electric furnace bundles	51.00-52.00
Electric furnace:	
3 ft and under	49.00-50.00
2 ft and under	50.00-51.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	54.00-55.00
Stove plate	54.00-55.00
Unstripped motor blocks	*45.00-46.00*
Charging box cast	37.00-38.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	55.00-56.00
Rails, 18 in. and under	69.00-70.00
Rails, rerolling	77.00-78.00
Rails, random lengths	*64.00-65.00*
Angles, splice bars	60.00-61.00

SEATTLE

No. 1 heavy melting	46.00
No. 2 heavy melting	44.00
No. 1 bundles	44.00
No. 2 bundles	31.00
Machine shop turnings	29.00
Mixed borings, turnings	29.00
Electric furnace No. 1	50.00

Cast Iron Grades

No. 1 cupola	40.00
Heavy breakable cast	37.00
Unstripped motor blocks	32.50
Stove plate (f.o.b. plant)	30.00

LOS ANGELES

No. 1 heavy melting	46.00
No. 2 heavy melting	43.00
No. 1 bundles	45.00
No. 2 bundles	38.00
Machine shop turnings	32.00
Shoveling turnings	34.00
Cast iron borings	32.00
Cut structural and plate, 1 ft and under	61.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	53.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00

SAN FRANCISCO

No. 1 heavy melting	*47.00*
No. 2 heavy melting	45.00
No. 1 bundles	*46.00*
No. 2 bundles	35.00
Machine shop turnings	32.00
Mixed borings, turnings	32.00
Cast iron borings	32.00
Heavy turnings	32.00
Short shovel turnings	*32.00*
Cut structurals, 3 ft	56.00

Cast Iron Grades

No. 1 cupola	*53.00-54.00*
Charging box cast	45.00-47.00
Stove plate	46.00
Heavy breakable cast	40.00
Unstripped motor blocks	*43.00*
Clean auto cast	55.00
No. 1 wheels	48.00
Drop broken machinery	53.00

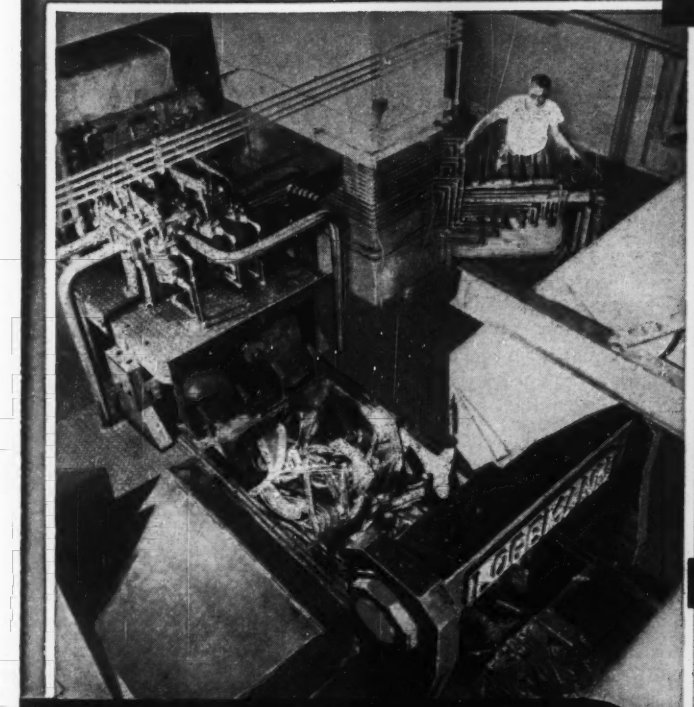
HAMILTON, ONT.

No. 1 heavy melting	50.00
No. 2 heavy melting	45.00
No. 1 bundles	50.00
No. 2 bundles	39.00
Mixed steel scrap	47.00
Mixed borings, turnings	24.00
Busheling, new factory:	
Prepared	50.00
Unprepared	44.00
Short steel turnings	30.00
Rails, rerolling	61.00

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b. Hamilton, Ont.



LOGEMANN Metal Balers

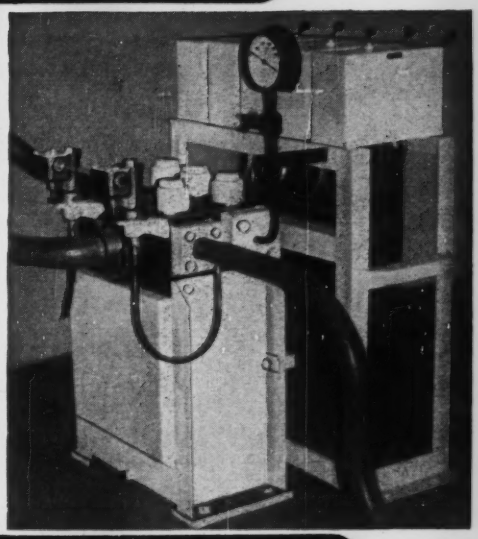
. . . powerful . . . compact . . . capable of high tonnage output!

In the large stamping plants and rolling mills where it is critically important that trim and stamping skeletons are quickly disposed of to avoid interference with production, LOGEMANN metal balers are relied on to keep ahead of production and pack such scrap into high density, self-cohering bricks for re-melting.

Hundreds of installations have established new records for tonnage, minimum maintenance, reliability, over extended periods of uninterrupted operation at high-speed.

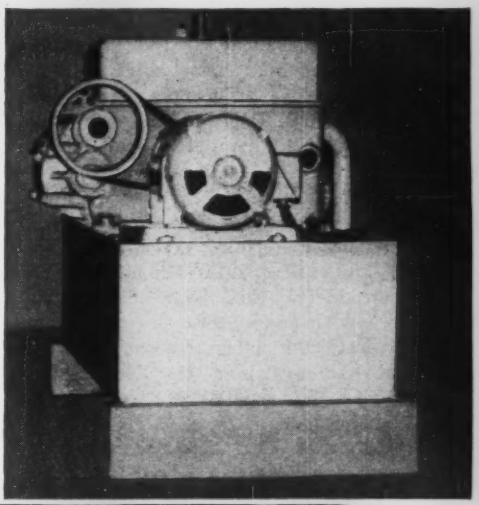
LOGEMANN models are not confined to the large sizes. Many small plants have found it profitable to use smaller sizes embodying the same features of reliability, at minimum operating cost. Interested parties are invited to write for details. Information as to the character of the scrap, tonnage to be handled in a given period of hours, and range of gauges is helpful in determining the proper model.

LOGEMANN



HYDRAULIC VALVES

The illustration shows a close-coupled hydraulic valve, operated by compressed-air cylinders for high-speed distribution of large gallonage of fluid at high pressure. LOGEMANN engineers have designed and built valves for many unusual as well as standard applications, and will welcome inquiries, with an outline of the conditions and requirements.



HYDRAULIC PUMPS

The opposed-cylinder close-coupled double pressure pump shown in the illustration is mounted on an individual tank to conserve floor space under present crowded plant and operating conditions. When requesting details, please indicate the nature of the service, pressure and gallonage requirements, and the fluid to be handled.

LOGEMANN BROTHERS CO.

3126 W. BURLEIGH STREET • MILWAUKEE 10, WISCONSIN

First Half Profits Dip

Slumping metals prices and profit squeeze are blamed. Lead and zinc sales are a little better, although zinc stocks continue to climb. Copper is still weak

Nonferrous Metal Prices, Pages 262 & 263

EARNINGS fell sharply in the first half for most nonferrous metal producers. A check of 13 leading companies shows ten had substantially lower net profits for the first six months of this year than in the corresponding period of 1956.

Copper, Lead, Zinc — Primary copper producers were perhaps the worst hurt. Two of the Big Three —Phelps Dodge Corp. and Kennecott Corp.—report first half earnings of $27,562,665 and $49,331,408 respectively, compared with $51,124,617 and $89,119,165 in 1956's first half. Revere Copper & Brass Inc. says its first half profits dipped to $4,558,092 from the 1956 figure of $5,047,291.

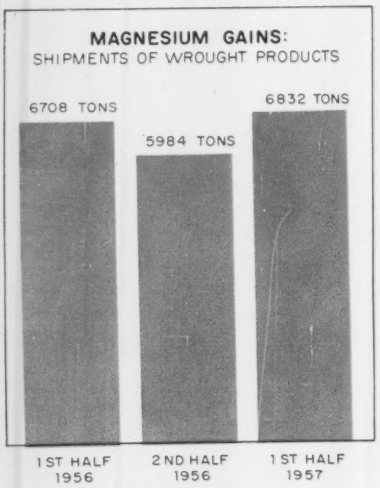
Other nonferrous firms which had disappointing results in the first half include Cerro de Pasco Corp., $2,543,281, compared with $6,891,216 in 1956; American Zinc, Lead & Smelting Co., $900,043, compared with $1,534,231; American Smelting & Refining Co., $13,393,700 compared with $21,890,000; American Metal Co., $5,349,011, compared with $8,282,186.

The three companies experiencing first half upswings are: New Jersey Zinc Co., $1,704,219, compared with $1,018,403 in 1956; National Lead Co., $30,115,564, compared with $28,998,985; and St. Joseph Lead Co., $5,759,433, compared with $5,076,591.

The chief culprit behind lower earnings is the depressed price of copper, lead, and zinc. A year ago, primary copper stood at 40 cents a pound. It has since seen five price reductions bringing it to the present 28.50 cents a pound.

Since last August, lead has dropped from 16 to 14 cents a pound; zinc from 13.50 to 10 cents a pound. Two major reasons are given for the price drops: 1. Rising production in the face of less demand. 2. A general slackening in business resulting in lower sales.

Aluminum—It's unanimous here —all three major producers had drops in first half earnings. Line-



up: Aluminum Co. of America, $38,038,979, against $48,615,304 in 1956; Reynolds Metals Co., $18,546,817, against $25,014,577; Kaiser Aluminum & Chemical Corp., $15,697,000, against $24,881,000.

The situation is a little different in aluminum than in other nonferrous metals. It's true sales are disappointing, but the big factor here is shrinking profit margins. Example: Both Reynolds and Kaiser had slightly higher sales in the first half than in the same period of 1956 even though profits dipped sharply. Alcoa's sales were down slightly but not as much as the profit differential would indicate.

Producers hope the recent price hike will pep up second half earnings.

Lead, Zinc Sales Fair

Lead and zinc sales still hold at slightly better levels for most producers (see STEEL, Aug. 12, p. 194), lead especially having improved recently.

Producers are hopeful the fall months will see an across-the-board pickup in demand. Detroit may hold the key to how well the industry fares.

Most metals men see lead and zinc prices stabilizing for the present although prices are far from firm. They're particularly encouraged by the way quotations have been holding up on the London Metal Exchange. Any fluctuation in the next few weeks will probably depend on two factors: 1. What Washington does about the proposed lead and zinc tariffs. 2. Quantity of new orders.

Consumers still buy on a hand-to-mouth basis and hold rock bottom inventories. According to the U. S. Bureau of Mines, consumer stocks of slab zinc dropped to 71,400 tons on May 31, the lowest total since early 1952.

Low customer inventories indicate rising zinc stocks in the hands of

NONFERROUS PRICE RECORD

	Price Aug. 14	Last Change	Previous Price	July Avg	June Avg	Aug., 1956 Avg
Aluminum ..	28.10	Aug. 1, 1957	27.10	27.100	27.100	26.700
Copper	28.25-28.50	Aug. 6, 1957	28.25-29.25	28.822	30.250	39.750
Lead	13.80	June 11, 1957	14.80	13.800	14.120	15.800
Magnesium .	35.25	Aug. 13, 1956	33.75	35.250	35.250	34.694
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	64.500
Tin	94.25	Aug. 13, 1957	94.125	96.576	98.080	99.043
Zinc	10.00	July 1, 1957	10.50	10.000	10.840	13.500

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.

producers. These stood at 146,153 tons at the end of July, the highest since 1953.

Another factor: Zinc smelter output in 1957 as of July 31 was 648,278 tons; at the same time last year it was 599,635 tons. However, total shipments are up: 570,898 tons for the first seven months of 1957 compared with 537,839 tons for the same period last year. But the total is up because more zinc is going to the government. Proof: Through July, domestic shipments totaled 430,688 tons, against 477,180 in the corresponding period of 1956.

Consumptionwise, 1957 should be a pretty good year, says the American Zinc Institute, which predicts total consumption of slab zinc will hit around 950,000 tons. This compares with the preliminary 1956 figure of 988,097 tons. Both years are short of the record of 1,119,812 tons in 1955, but they are well ahead of 1952 and 1954.

Copper Fails To Respond

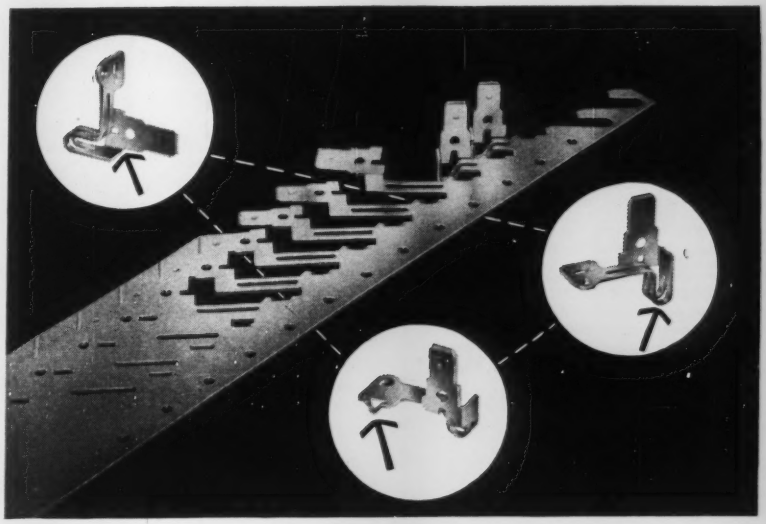
The Aug. 6 price cut in primary copper hasn't helped boost sales. Producers report they are shipping no more now than before. Possible reason: The approximate 2 cents a pound difference between the domestic price and foreign quotations makes buyers bashful about ordering large quantities.

Brass mills haven't come into the market for any large quantities because of copper's relative price instability. Their problem: Mill shipments are billed according to the price prevailing on the day of shipment. If prices should drop between the time copper is purchased and the shipping date of a fabricated item to a customer, the mill would have to base its charges on the lower quotation.

Silver Price Up

Silver prices have increased nearly 1 cent in the last three weeks to 91.125 cents a troy ounce. Causes: 1. Increased demand from abroad. 2. Pickup in domestic sales.

Production of refined silver in the first half was 34,883,000 fine oz, down 4,965,000 oz from 1956's first half output of 39,848,000 oz, reports the American Bureau of Metal Statistics.



Cut costs on tough forming jobs with Elephant Brand® fine grain phosphor bronze

Automatic metal-forming machines operate best when they are fed materials of uniform, dependable quality. To shape critical details like those shown on these switch parts, many manufacturers rely on Seymour ELEPHANT BRAND phosphor bronze. Its fine grain permits making sharp bends, severe draws and other complex forming operations with a minimum of rejections or tooling adjustments.

Seymour ELEPHANT BRAND combines in one fine grain phosphor bronze alloy, high ductility, great strength, uniform temper, long fatigue life, and fine finish. These qualities prompt discerning users to say:—"Specify Seymour ELEPHANT BRAND . . . there's no finer phosphor bronze!"

ALL ELEPHANT BRAND phosphor bronze is fine grain

The first phosphor bronze produced in the U.S. was ELEPHANT BRAND. Made by a carefully guarded process which insures the highest degree of purity and uniformity, it has a grain structure of very fine, uniform crystals free from segregation, coring or residual dendritic structure. Thus, ELEPHANT BRAND is a quality standard as well as a trade-mark for the original and finest phosphor bronze.

Your Seymour Representative is trained to help you solve metals problems. Why not call him today?

THE SEYMOUR MANUFACTURING COMPANY

3 FRANKLIN ST., SEYMOUR, CONNECTICUT

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 26.00; ingots, 28.10, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 29.90; No. 43, 29.70; No. 195, 31.30; No. 241, 31.50; No. 356, 29.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100-lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $120 per lb, nom.

Copper: Electrolytic, 28.50 deld.; custom smelters, 28.25; lake, 28.50 deld.; fire refined, 28.25 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U.S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $100-110 nom. per troy oz.

Lead: Common, 13.80; chemical, 13.90; corroding, 13.90, St. Louis, New York basis, add 0.20.

Lithium: 98+%, cups or ingots, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 13 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91B (die casting), 37.25 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $252-255 per 76-lb flask.

Molybdenum: Extruded ingot, $9.60 per pound, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter, 71.25 per lb of nickel content before 1 cent freight allowance, f.o.b. Copper Cliff, Ont.

Osmium: $80-100 per troy oz, nom.

Palladium: $21-21.50 per troy oz.

Platinum: $83-87 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $10.50 per lb, commercial grade.

Silver: Open market, 91.125 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55. per lb.

Tellurium: $1.65-1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 94.25.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.), $2.25; grade A-2 (0.5% Fe max.), $2.00 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.75 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $4.50.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 11.35; special high grade, 11.75 deld. Die casting alloy ingot No. 3, 14.25; No. 2, 15.25; No. 5, 14.75 deld.

Zirconium: Sponge, commercial grade, $5-10 per lb.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 24.75-30.25; No. 12 foundry alloy (No. 2 grade), 22.75-23.25; 5% silicon alloy, 0.60 Cu max., 26.00-26.50; 13 alloy, 0.60 Cu max., 26.00-26.50; 195 alloy, 25.75-26.75; 108 alloy, 23.25-24.00. Steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 24.50; grade 2, 22.75; grade 3, 21.75; grade 4, 20.75.

Brass Ingot: Red brass, No. 115, 29.50; tin bronze, No. 225, 39.00; No. 245, 33.50; high-leaded tin bronze, No. 305, 33.50; No. 1 yellow, No. 405, 24.00; manganese bronze, No. 421, 27.00.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 37.50; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.80, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.77, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 33.855; l.c.l., 34.48. Weatherproof, 30,000-lb lots, 35.16; l.c.l., 35.91. Magnet wire deld., 15,000 lb or more, 41.93; l.c.l., 42.68.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $19.50 per cwt; pipe, full coils, $19.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $9.50-15.95; sheared mill plate, $8.00-11.50; wire, $7.50-11.50; forging billets, $6.00-7.60; hot-rolled and forged bars, $6.15-7.90.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates, 19.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.00-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100 and 3003 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.249-0.136	43.10-47.60	....
0.135-0.096	43.60-48.70	40.50-41.10
0.095-0.077	44.30-50.50	40.60-41.30
0.076-0.061	44.90-52.80	40.80-42.00
0.060-0.048	45.60-55.10	41.40-43.10
0.047-0.038	46.20-57.90	41.90-44.50
0.037-0.030	46.60-62.90	42.30-46.30
0.029-0.024	47.20-54.70	42.60-47.00
0.023-0.019	48.20-58.10	43.70-45.40
0.018-0.017	49.00-55.40	44.30-46.00
0.016-0.015	49.90-56.30	45.10-46.80
0.014	50.90	46.10-47.80
0.013-0.012	52.10	46.80
0.011	53.10	48.00
0.010-0.0095	54.60	49.40
0.009-0.0085	55.90	50.90
0.008-0.0075	57.50	52.10
0.007	59.00	53.60
0.006	60.60	55.00

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.70	47.50
5050-F	43.80	48.60
3004-F	44.80	50.50
5052-F	45.40	51.20
6061-T6	46.90	53.00
2024-T4*	50.60	57.40
7075-T6*	58.40	66.00

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	—Round— 2011-T3	2017-T4	—Hexagonal— 2011-T3	2017-T4
Drawn				
0.125	78.20	75.20	....	....
0.156-0.172	66.20	63.40	....	....
0.188	66.20	63.40	....	81.60
0.219-0.234	63.00	61.50	....	....
0.250-0.281	63.00	61.50	....	77.90
0.313	63.00	61.50	....	74.20
0.344	62.50	....	....	....
Cold-Finished				
0.375-0.547	62.50	61.30	74.80	69.80
0.563-0.688	62.50	61.30	71.10	65.50
0.719-1.000	61.00	59.70	64.90	61.70
1.063	61.00	59.70	....	59.60
1.125-1.500	58.60	57.40	62.80	59.60
Rolled				
1.563	57.00	55.70	....	....
1.625-2.000	56.30	54.90	....	57.50
2.125-2.500	54.80	53.40	....	....
2.563-3.375	53.20	51.70	....	....

Forging Stock: Round, Class 1, 45.20-58.60 in specific lengths, 36-144 in., diam. 0.375-8 in. Rectangles and squares, Class 1, 50.50-66.60 in random lengths, 0.375-4 in. thick, width 0.750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$19.40	2	$ 59.90
1	30.50	4	165.05
1¼	41.30	6	296.10
1½	49.40	8	445.55

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	45.40-47.00	60.60-64.80
12-14	45.70-47.20	61.30-65.80
15-17	45.90-47.90	62.50-67.50
18-20	46.50-48.30	64.50-70.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Thread plate, .188 in., 71.70; .250-2.00 in., 70.60. Tooling plates, .250-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Aluminum: 1100 clippings, 14.00-14.50; old sheets, 10.50-11.00; borings and turnings, 7.00-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	50.63b	47.86c	....	50.82	24.500	24.500	23.750
Yellow Brass	44.02	32.23d	44.56	46.93	18.375	18.125	16.625
Low Brass, 80%	46.70	46.64	47.24	49.51	20.750	20.500	20.000
Red Brass, 85%	47.64	47.58	48.18	50.45	21.500	21.250	20.750
Com. Bronze, 90%	49.13	49.07	49.67	51.69	22.375	22.125	21.625
Manganese Bronze	51.89	46.06	56.52	....	17.250	17.000	16.500
Muntz Metal	46.29	42.10	....	....	17.250	17.000	16.500
Naval Brass	48.19	42.50	55.25	51.60	17.000	16.750	16.250
Silicon Bronze	55.20	54.39	55.24	57.21e	24.000	23.750	23.000
Nickel Silver, 10%	60.41	62.74g	62.74	....	24.625	24.375	12.313
Phos. Bronze, A-5%	69.61	70.11	70.11	71.29	25.375	25.125	24.125

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

7.50; crankcases, 11.00-11.50; industrial castings, 11.00-11.50.

Copper and Brass: No. 1 heavy copper and wire, 20.75-21.25; No. 2 heavy copper and wire, 19.25-19.75; light copper, 17.00-17.50; No. 1 composition red brass, 18.50-19.00; No. 1 composition turnings, 18.00-18.50; yellow brass turnings, 10.75-11.25; new brass clippings, 17.00-17.50; light brass, 10.50-11.00; heavy yellow brass, 12.50-13.00; new brass rod ends, 14.50-15.00; auto radiators, unsweated, 13.50-14.00; cocks and faucets, 14.50-15.00; brass pipe, 15.50-16.00.

Lead: Heavy 9.50-10.00; battery plates, 4.25-4.50; linotype and stereotype, 11.50-12.00; electrotype, 10.00-10.50; mixed babbitt, 11.00-11.50.

Monel: Clippings, 50.00-53.00; old sheets, 50.00-53.00; turnings, 40.00-43.00; rods, 50.00-53.00.

Nickel: Sheets and clips, 85.00-90.00; rolled anodes, 85.00-90.00; turnings, 70.00-75.00; rod ends, 85.00-90.00.

Zinc: Old Zinc, 3.00-3.25; new die-cast scrap, 2.75-3.00; old die-cast scrap, 1.50-1.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 17.50-18.00; 3003 clippings, 17.50-18.00; 6151 clippings, 17.00-18.00; 5052 clippings, 17.00-17.50; 2014 clippings, 16.50-17.50; 2017 clippings, 16.50-17.50; 2024 clippings, 16.50-17.50; mixed clippings, 16.00-16.50; old sheets, 14.00-14.50; old cast, 14.00-14.50; clean old cable (free of steel), 17.00; borings and turnings, 14.50-16.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 51.00; light scrap, 46.00; turnings and borings, 31.00.

Copper and Brass: No. 1 heavy copper and wire, 24.00; No. 2 heavy copper and wire, 22.00; light copper, 19.75; refinery brass (60% copper) per dry copper content, 21.50.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 24.00; No. 2 heavy copper and wire, 22.00; light copper, 19.75; No. 1 composition borings, 20.50; No. 1 composition solids, 21.00; heavy yellow brass solids, 15.00; yellow brass turnings, 14.00; radiators, 16.00.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 46.79; oval, 45.00, 5000-10,000 lb; electrodeposited, 38.75, 2000-5000 lb lots; cast, 40.25, 5000-10.000 quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30.000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 112.50; 200-499 lb, 111.00; 500-999 lb, 110.50; 1000 lb or more, 110.00.

Zinc: Balls, 17.50; flat tops, 17.50; flats, 19.25; ovals, 18.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb in 100-lb drums.

Chromic Acid: 100 lb, 33.30; 500 lb, 32.80; 2000 lb, 32.15; 5000 lb, 31.80; 10,000 lb, 31.30, f.o.b. Detroit.

Copper Cyanide: 100-200 lb, 74.80; 300-900 lb, 72.80.

Copper Sulphate: 100-1900 lb, 14.95; 2000-5900 lb, 12.95; 6000-11,900 lb, 12.70; 12,000-22,900 lb, 12.45; 23,000 lb or more, 11.95.

Nickel Chloride: 100 lb, 48.50; 200 lb, 46.50; 300 lb, 45.50; 400 lb, 43.50; 5000 lb, 41.50; 10,000 lb, 40.50.

Nickel Sulphate: 100 lb, 40.50; 200 lb, 38.50; 300 lb, 37.50; 400-4900 lb, 35.50; 5000-29,900 lb, 33.50; 30.000 lb or more, 32.50.

Sodium Cyanide: 100 lb, 27.50; 200 lb, 25.80; 400 lb, 22.80; 1000 lb, 21.80; f.o.b. Detroit.

Sodium Stannate: Less than 100 lb. 75.20; 100-600 lb, 66.20; 700-1900 lb, 63.50; 2000-9900 lb, 61.60; 10,000 lb or more, 60.30.

Stannous Chloride (anhydrous): Less than 25 lb, 164.70, 25 lb, 129.70; 100 lb, 114.70; 400 lb, 112.20; 5200-19,600 lb, 100.00; 20,000 lb or more, 87.80.

Stannous Sulphate: Less than 50 lb, 127.50; 50 lb, 97.50; 100-1900 lb, 95.50; 2000 lb or more, 93.50.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

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ALUMINUM AND STEEL

Well established, large volume manufacturer of high precision sheet and extrusion aluminum and stainless steel products invites your inquiries. Stamping, milling, forming, broaching, finishing, assembly, packing. Modern plant facilities; experienced and highly trained production and engineering personnel: AA-A1 rated. Inquiries also invited from qualified Manufacturer's Representatives. **Box No. 582, STEEL, Penton Bldg., Cleveland 13, Ohio.**

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Are you interested in technical sales? If you are under 30, hold *any* technical degree (chemistry, metallurgy or ceramics preferred) and have had several years' experience in industry, then this is an opportunity to utilize your engineering abilities *and your imagination*. These positions offer a financially rewarding future with a leading manufacturer and require the ability to contact top operating and technical personnel in large manufacturing concerns which we supply. Requires extensive travel for first year and limited travel thereafter. Send resume, with salary requirements, to

Box 581, STEEL
Penton Bldg. Cleveland 13, Ohio

WANTED ASSISTANT METALLURGIST

Commercial metal treating shop located in Chicago and operating on a 'round-the-clock basis has immediate opening for graduate metallurgist or mechanical engineer as assistant to chief metallurgist and plant superintendent. Address reply to

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Penton Bldg. Cleveland 13, Ohio

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Help Wanted

STRUCTURAL STEEL DETAILING CHIEF

Chicago area Structural Steel Fabricator needs Chief Engineer to take full charge of detailing and engineering. Must be 30 to 45 years old licensed structural engineer with 5 years heavy structural detailing experience and preferably C.E. degree. Real chance to assume and build executive position with old established company. Should be worth $1,000.00 per month or more. Essential technical experience needs to be supplemented by administrative ability and personality. If fully qualified, send resume of work record and education with snapshot if available. Address Box 580, STEEL, Penton Bldg., Cleveland 13, Ohio.

PLANT SUPERINTENDENT

For Steel Fabricating shop in metropolitan New York Area producing pressure vessels, tanks and other weldments of steel stainless, etc. Must be thoroughly experienced in welded construction design, and welding equipment. Must be a good organizer and capable of taking complete responsibility. Liberal Salary for the right man and excellent incentive. Write Box 583, STEEL, Penton Bldg., Cleveland 13, Ohio.

Positions Wanted

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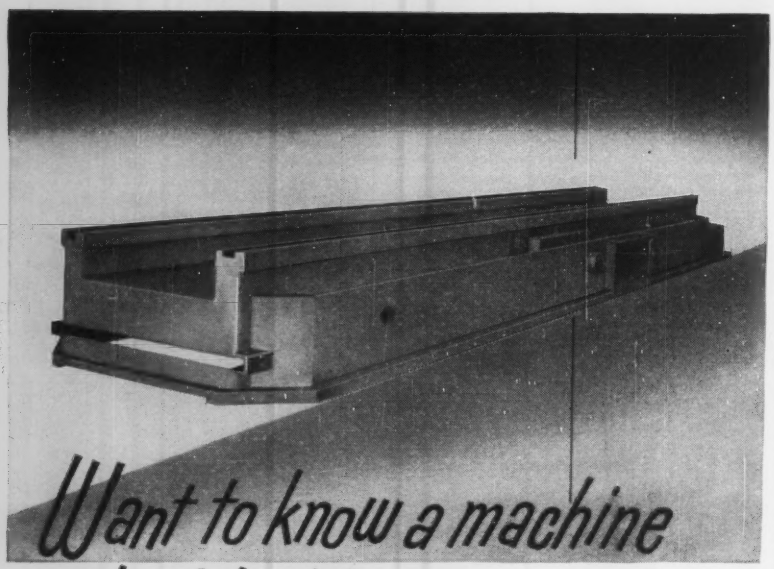

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Advertising Index

Abbey Etna Co. 253
Abell-Howe Co. 214
Acme-Newport Steel Co. 234
Acme Welding Division of The United Tool & Die Co. 264
Adams, R. P., Co., Inc. 251
Air Reduction Sales Co., A Division of Air Reduction Co., Inc. 71
Ajax Engineering Corporation 22
Alan Wood Steel Co. 208
Aldrich Pump Co. 99
Alemite, Division of Stewart-Warner Corporation 21
Allegheny Ludlum Steel Corporation, Forging & Casting Division 54
Allis-Chalmers, Buda Division 47
Aluminum Company of America 218, 219
Aluminium Limited Sales, Inc. 17
American Brake Shoe Co., Denison Engineering Division 24
American Brake Shoe Co., Electro-Alloys Division 30
American Brass Co., The 227
American Brass Co., The, The Ansonia Division 236
American Cast Iron Pipe Co., Special Products Division 90
American Chain & Cable, American Chain Division 216
American Chain Division, American Chain & Cable 216
American Chemical Paint Co. 96
American Gas Association 69
American Smelting & Refining Co., Continuous-Cast Products Department 65
American-Standard, Ross Heat Exchanger Division 52
Apex Machine & Tool Co., The 212
Armco Steel Corporation 104
Associated Spring Corporation 35
Atlas Mineral Products Co. 232

Babcock & Wilcox Co., The, Refractories Division 189
Babcock & Wilcox Co., The, Tubular Products Division Inside Front Cover
Baldwin-Lima-Hamilton Corporation, Hamilton Division 84
Baldwin-Lima-Hamilton Corporation, Loewy-Hydropress Division 85
Barnes-Gibson-Raymond, Division of Associated Spring Corporation 35
Barnes, Wallace, Co., Division of Associated Spring Corporation 35
Barnes, Wallace, Co., The, Ltd., Division of Associated Spring Corporation 35
Barnes, Wallace, Steel Division, Associated Spring Corporation 35
Bay State Abrasive Products Co. 72
Bethlehem Steel Co. 1
Bishop, J., & Co. Platinum Works, Stainless Steel Products Division 80
Blickman, S., Inc. 191
Bliss & Laughlin, Inc. 43
Borg-Warner Corporation, Industrial Crane & Hoist, Ingersoll Products Division 88
Borg-Warner Corporation, Ingersoll Steel Division 131
Bower Roller Bearing Division, Federal-Mogul-Bower Bearings, Inc. 187
Brainard Steel Strapping Division, Sharon Steel Corporation 141
Broderick & Bascom Rope Co. 253
Browning, Victor R., & Co., Inc. 253
Bucyrus-Erie Co. 140
Buda Division, Allis-Chalmers 47
Buffalo Forge Co. 29
Bullard Co., The 36
Buschman, E. W., Co., The 251

C & D Batteries, Inc. 200
Carpenter Steel Co., The, Alloy Tube Division 213
Chambersburg Engineering Co. 78
Chicago & Eastern Illinois Railroad 10
Chicago Steel Service Co. 172
Cincinnati Gear Co., The 209
Cincinnati Milling Machine Co., The, Cincinnati Milling Products Division 2
Cleveland-Cliffs Iron Co., The 38
Cleveland Crane & Engineering Co., The 98
Colorado Fuel & Iron Corporation, The 63, 184, 185
Columbia-Geneva Steel Division, United States Steel Corporation 25
Conco Engineering Works, Division of H. D. Conkey & Co. 177
Continental Steel Corporation 161
Continuous-Cast Products Department, American Smelting & Refining Co. 65
Coolidge Corporation 127
Crosby Co., The 11
Crucible Steel Company of America 40
Curtis Manufacturing Co., Pneumatic Division 255
Curtiss-Wright Corporation, Metals Processing Division 68

Damascus Tube Co. 93
De Laval Steam Turbine Co. 165
Dempster Brothers 66
Denison Engineering Division, American Brake Shoe Co. 24
DeVilbiss Co., The 146
Diesel Chemical & Metal Co. 263
DoAll Co., The 228
Dodge Manufacturing Corporation 142, 143

Dravo Corporation 166
Dreis & Krump Manufacturing Co. 12
Duff-Norton Co. 170
Dunbar Brothers Co., Division of Associated Spring Corporation 35
Dykem Co., The 253

Eastern Stainless Steel Corporation 174, 175
Easton Car & Construction Co. 191
Elastic Stop Nut Corporation of America 39
Electric Controller & Mfg. Co., The, A Division of The Square D Co. 203
Electric Equipment Co. 263
Electric Steel Foundry Co. 56
Electro-Alloys Division, American Brake Shoe Co. 30
Electro Metallurgical Co., Division of Union Carbide Corporation 20
Elwell-Parker Electric Co., The 7
Eureka Fire Brick Works 254

Farval Corporation, The ..... Inside Back Cover
Federal-Mogul-Bower Bearings, Inc., Bower Roller Bearing Division 187
Federal Products Corporation 70
Foster, L. B., Co. 263

Gardner-Denver Co. 64
Garlock Packing Co., The 57
Gates Rubber Co., The 229
General American Transportation Corporation, Parker-Kalon Division 82
General Electric Co., Metallurgical Products Department 58, 59
General Motors Corporation, Hyatt Bearings Division 120
General Motors, New Departure Division 123
General Refractories Co. 183
Gibson, William D., Co., The, Division of Associated Spring Corporation 35
Gisholt Machine Co. 204, 205
Goodyear Tire & Rubber Co., The 4
Green, A. P., Fire Brick Co. 134
Griphoist, Inc. 188

Hamilton Division, Baldwin-Lima-Hamilton Corporation 84
Hanson-Van Winkle-Munning Co. 60
Hanson-Whitney Co., Division of The Whitney Chain Co. 23
Harbison-Walker Refractories Co. 81
Harrington & King Perforating Co., Inc., The 254
Hassall, John, Inc. 16
Heresite & Chemical Co. 190
Hobart Brothers Co. 3
Holcroft & Co. 138
Holo-Krome Screw Corporation, The 53
Hoover Ball & Bearing Co. 217
Hyatt Bearings Division, General Motors Corporation 120

Illinois Tool Works 79
Industrial Crane & Hoist, Ingersoll Products Division, Borg-Warner Corporation 88
Ingersoll-Rand 160
Ingersoll Steel Division, Borg-Warner Corporation 131
Inland Steel Co. 210, 211
International Nickel Co., Inc., The 100
Ironsides Co., The 18, 19

Jomac, Inc. 126
Jones & Laughlin Steel Corporation 171
Jones & Laughlin Steel Corporation, Stainless Steel Division 198, 199

Kane & Roach, Inc. 73
Keystone Steel & Wire Co. 97
Kingsbury Machine Tool Corporation 223

Landis Tool Co. 14, 15
LeBlond, R. K., Machine Tool Co., The 144, 145
Levinson Steel Co., The 215
Link-Belt Co. 9
Lodge & Shipley Co., The 42
Loewy-Hydropress Division, Baldwin-Lima-Hamilton Corporation 85
Loftus Engineering Corporation 226
Logemann Brothers Co. 259
Lord Baltimore Hotel, The 254
Luria Brothers & Co., Inc. 256

McGill Manufacturing Co., Inc. 148

Mahon, R. C., Co., The 55
Manning, Maxwell & Moore, Inc. 207
Manross, F. N., & Sons Co., Division of Associated Spring Corporation 35
Metal & Thermit Corporation 95
Metallurgical Products Department of General Electric Co. 58, 59
Milwaukee Division of Associated Spring Corporation 35
Minnesota Mining & Manufacturing Co. 48, 241
Minnesota Mining & Manufacturing Co., Adhesives & Coatings Division 133
Morgan Construction Co. 115
Motch & Merryweather Machinery Co., The, Machinery Manufacturing Division 221
Mundt, Charles, & Sons 183

National Automatic Tool Co., Inc. 31
National-Standard Co. 37
National Steel Corporation 67
New Departure, Division of General Motors 123
Niagara Blower Co. 223

Ohio Division of Associated Spring Corporation 35
Ohio Ferro-Alloys Corporation 61
Ohio Steel Foundry Co., The 128
Orban, Kurt, Co., Inc. 242
Owen Bucket Co., The 255

Parker-Kalon Division, General American Transportation Corporation 82
Pennsalt Chemicals Corporation 230, 231
Pittsburgh Steel Co. 50, 51
Pivot Punch & Die Corporation 251
Pollock, William B., Co., The 89
Princeton Griphoist, Inc. 188

Raymond Manufacturing Co., Division of Associated Spring Corporation 35
Reading Crane & Hoist Corporation 265
Republic Steel Corporation 178, 179
Research-Cottrell, Inc. 162, 163
Revere Copper & Brass, Inc. 196
Reynolds Aluminum Co. 222
Rivett Lathe & Grinder, Inc. 62
Rockwell Manufacturing Co., Rockwell-Nordstrom Valve Division 41
Roebling's, John A., Sons Corporation, A Subsidiary of The Colorado Fuel & Iron Corporation 63
Ross Heat Exchanger Division of American-Standard 52

Sandusky Foundry & Machine Co. 49
Sciaky Bros., Inc. 181, 182
Scott Paper Co. 77
Seaboard Pacific Division, Associated Spring Corporation 35
Selas Corporation of America 83
Service Steel 251
Seymour Manufacturing Co., The 261
Sharon Steel Corporation, Brainard Steel Strapping Division 141
Square D Co., The, The Electric Controller & Mfg. Co. Division 203
Stalwart Rubber Co. 238
Stamco, Inc. 251
Standard Oil Co. (Indiana) 44, 45
Standard Pressed Steel Co., Flexloc Locknut Division 87
Stanley Steel Strapping, Division of The Stanley Works 91
Sterling Wheelbarrow Co. 188
Stewart-Warner Corporation, Alemite Division 21
Superior Steel Corporation 147
Superior Tube Co. 176
Surface Combustion Corporation 168, 169

Taylor-Winfield Corporation, The 76
Tennessee Coal & Iron Division, United States Steel Corporation 25
Thomas Flexible Coupling Co. 220
Thompson Grinder Co., The 136, 137
Timken Roller Bearing Co., The, Steel & Tube Division 124
Tool Steel Gear & Pinion Co., The 13
Torrington Co., The 103
Townsend Co. 167
Transue & Williams 157
Tube Methods, Inc. 240

Udylite Corporation, The 186
Union Carbide Corporation, Electro Metallurgical Division 20
Union Wire Rope Corporation 94
United Engineering & Foundry Co. 233
United States Steel Corporation, Subsidiaries 25, 26, 27, 28
United States Steel Export Co. 25
United States Steel Supply Division, United States Steel Corporation 25
United Tool & Die Co., The, Acme Welding Division 264
Universal Atlas Cement Co. 28
Upson-Walton Co., The 240

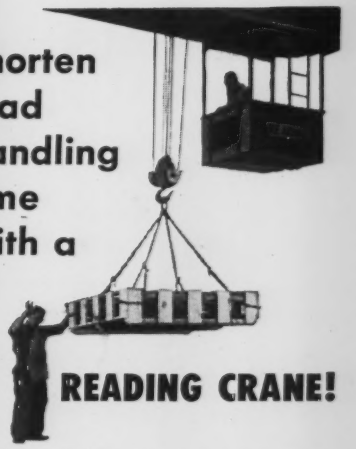
Vanadium Corporation of America 86
Victor Equipment Co. 92

Walsh Refractories Corporation 6
Warner & Swasey 139
Washburn Wire Co. 46
Washington Steel Corporation 266
Waterbury Farrel Foundry & Machine Co., The 159
Wean Engineering Co., Inc., The ..... Back Cover
Weirton Steel Co. 67
West Penn Power Co., Area Development Department 239
Westinghouse Electric Corporation 32, 33, 74, 75, 192, 193, 224, 225
Wheland Co., The 265
Whiting Corporation 116
Whitney Chain Co. 34
Whitney Chain Co., The, Hanson-Whitney Division 23
Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation 184, 185
Wrought Washer Manufacturing Co. 106

Youngstown Sheet & Tube Co., The 8

Table of Contents, Page 5

Classified Advertising, Page 263



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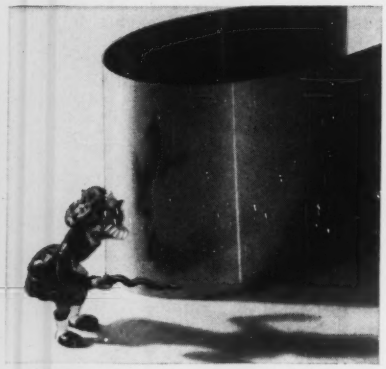
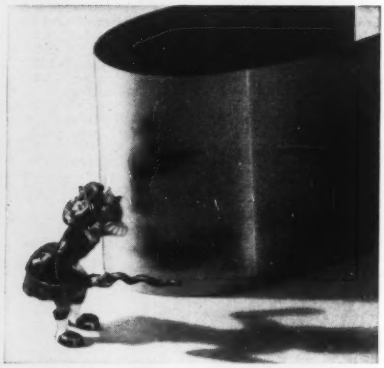
2D—A silvery white, but non-lustrous, surface produced by annealing and pickling cold reduced material. Steel sheets & strip in this condition are most ductile and the surface holds lubricant well for severe drawing operations.



2B—Steel in the 2D condition which is subsequently rolled on a "skin pass" or temper mill. The surface acquires a bright finish from the polished rolls. This surface is somewhat more dense and hard than 2D and is a better starting surface for later finishing and buffing operations.



No. 3—This surface is made by grinding with a No. 100 abrasive. This surface is smooth but not as reflective as 2B.

No. 4—A finer finish than No. 3 made by grinding with a No. 150 abrasive. Like No. 3, this surface is easily blended with hand grinders after forming, drawing or welding.

No. 7—Good reflectivity and brilliance made by polishing with a No. 400 abrasive. This semi-mirror finish must be protected during fabrication by adhesive paper or strippable plastics lest the finish be marred beyond repair.

BRIGHT—A highly reflective surface made by cold reducing with highly polished, glass-hard rolls. This finish is only available in Type 430 stainless.

These are our standard surface finishes that are available in types 201, 202, 301, 302, 304 and 430 except Bright which is type 430 exclusively.

These finishes are regularly supplied in sheet and coil form in widths up to 48 inches.

Since Nos. 3, 4, 7 and 430 Bright are smooth reflective surfaces, they are not recommended for severe drawing without special precautions as the mill finish may be marred. Applications such as dairy machinery, kitchen and restaurant equipment and architectural decorative work require only local forming, so these highly polished surfaces are not greatly disturbed. All mill polished sheets are carefully packed to avoid handling imperfections. Protective adhesive paper can be specified by the buyer when needed.

For specific information on recommended surface characteristics for a particular stainless steel sheet and strip application, address your request to our Product Development Dept.

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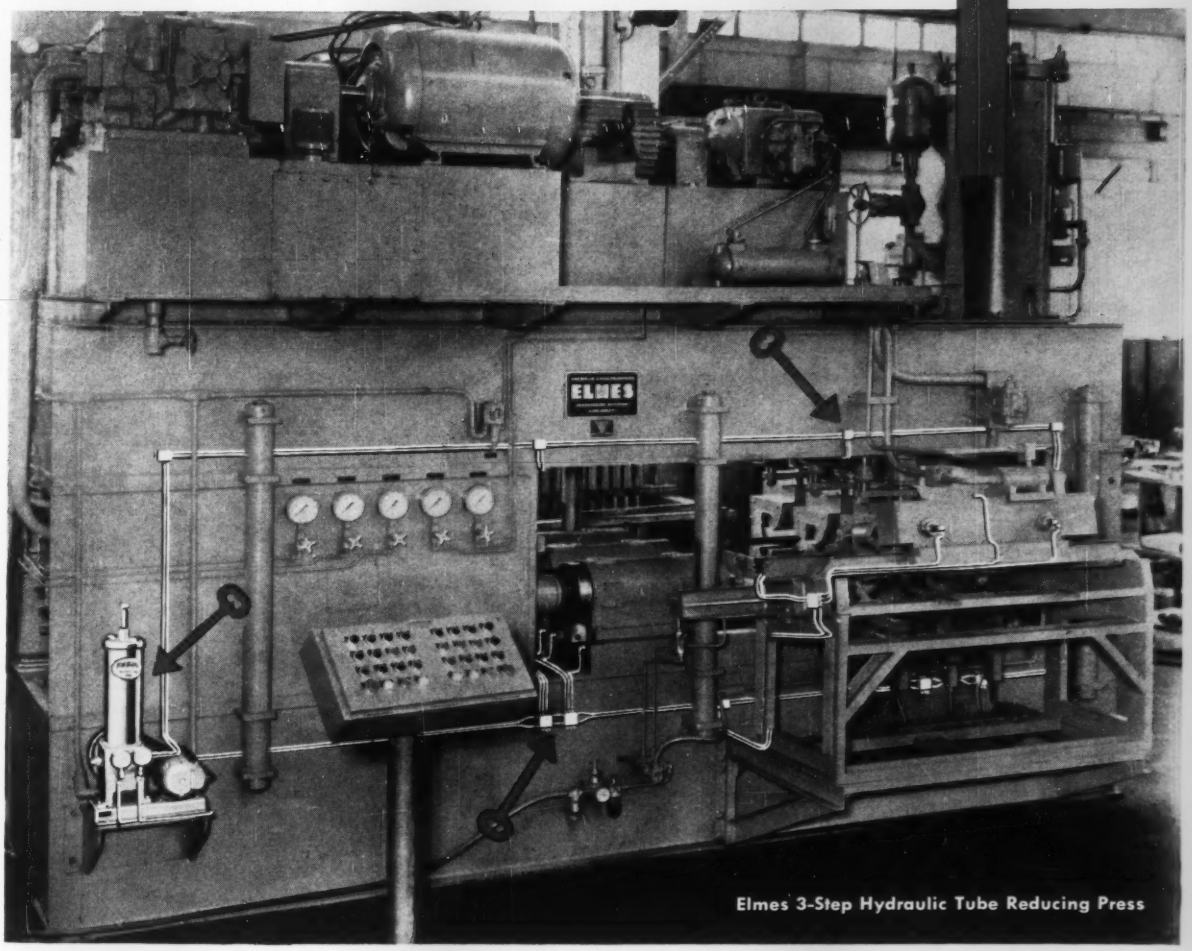
Never a holdup or slowdown to lubricate this tube reducer in Michigan auto factory

FARVAL—
Studies in Centralized Lubrication
No. 203



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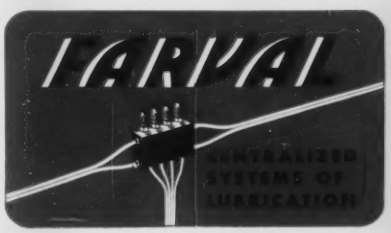
This *Farvalized* machine is an Elmes 60-ton Tube Reducer. In three steps it reduces tubing for drive shafts for a well-known Michigan-made automobile.



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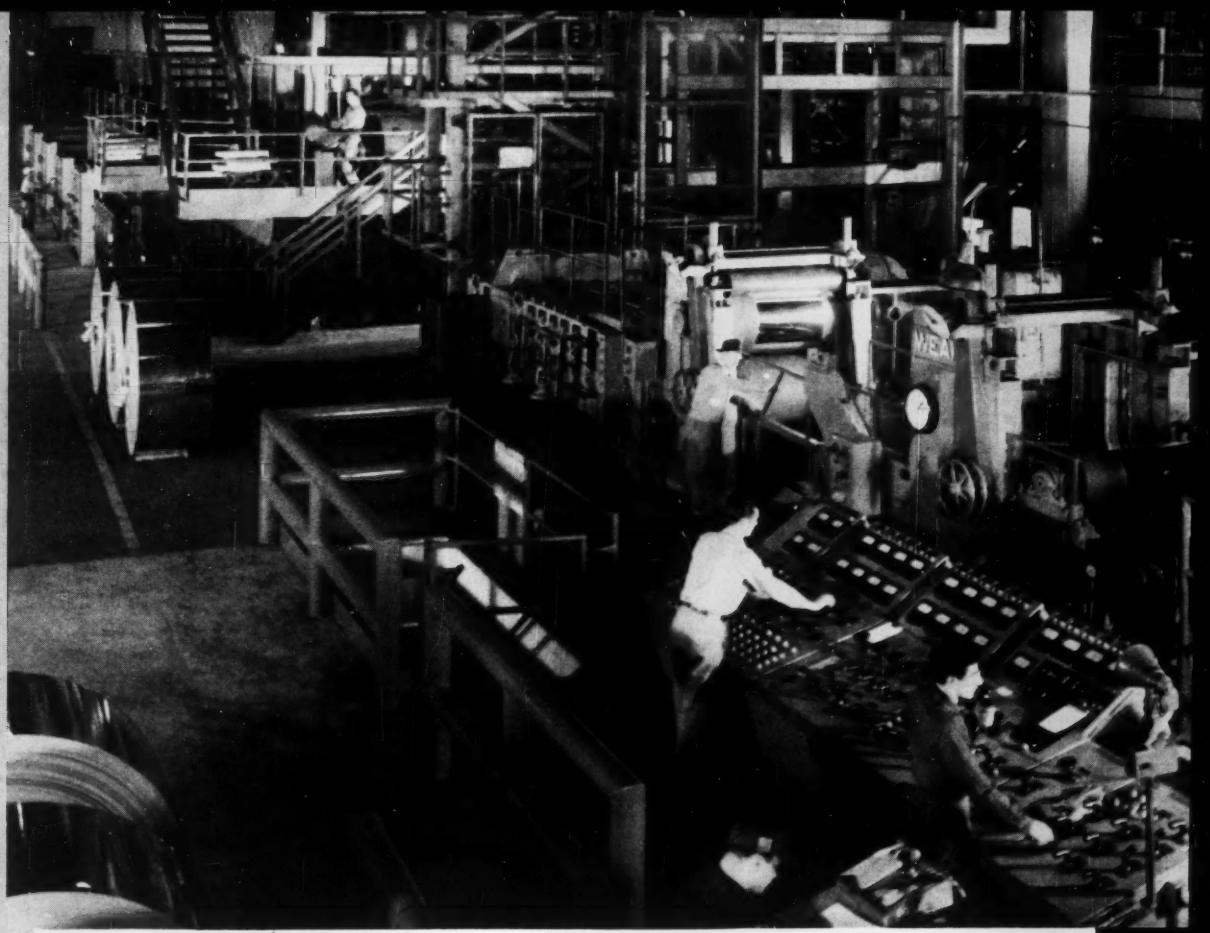
WEAN creative engineering



Main operating control station controls entire tinning line. Photo courtesy Jones & Laughlin Steel Corp.

• 75% of all electrolytic tin plate is produced on Wean engineered lines . . . and for a very good reason. Wean, a pioneer in continuous coating lines, has played a major role in bringing tin plate production equipment to its present high degree of efficiency.

Some time ago, for example, Wean adapted automation to tin plate production—enabling lines to produce continuously—establishing records both for speed of production and quality of product; in short, enabling tin plate producers to keep abreast of modern industrial demands.

So, if you're looking for tin plate facilities to meet today's exacting requirements . . . look to Wean, world's foremost designer of electrolytic cleaning and tin plate equipment.

339

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